NATURE MAGAZINE

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AUGUST · 1934

TO STIMULATE PUBLIC INTEREST IN NATURE
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MCMXXIII

MONKEY NEIGHBORS
Walter J. Wilwerding

CATS AND BIRDS
Mildred Garner

LORD AND LADY PIGEON
Merton S. Yewdale

BRINGING SHORE LIFE HOME
Ward B. Holt

SMOKY MOUNTAIN PARK
Carlos C. Campbell

IRIS PROGRESS
Howard Evarts Weed

NATURE MAGAZINE

PUBLISHED BY THE AMERICAN NATURE ASSOCIATION

To Stimulate Public Interest in Every Phase of Nature and the Out-Of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

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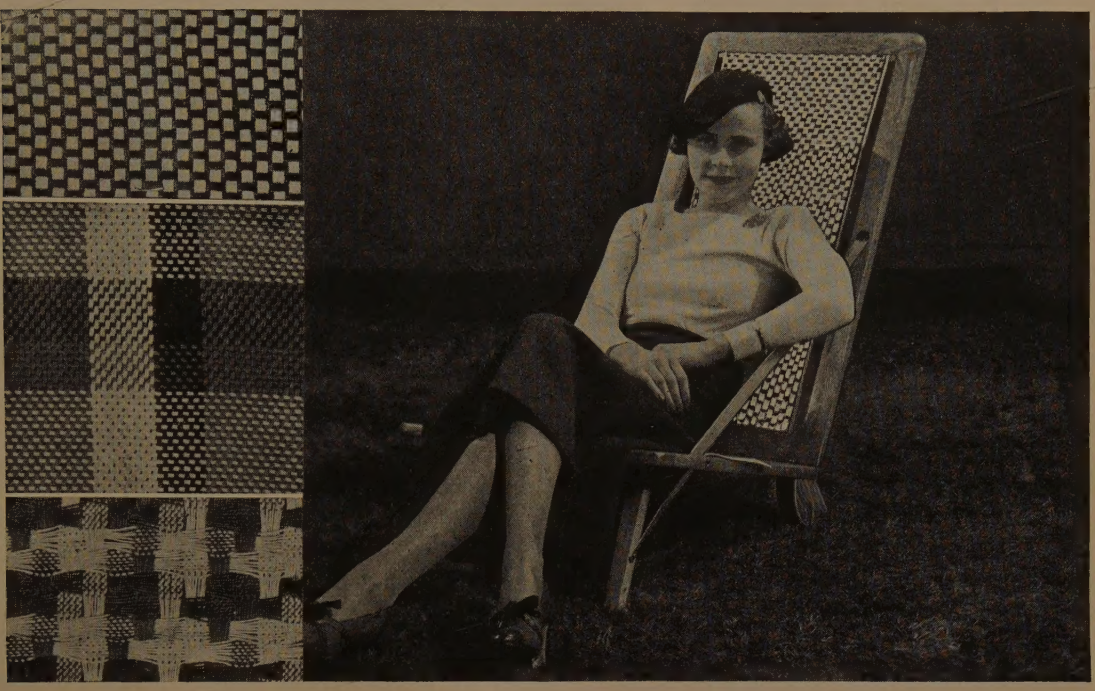

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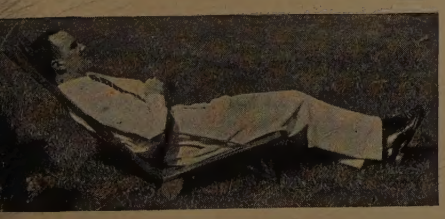

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ALPINE PHOTOGRAPHY

By Raymond A. Wohlrabe

In fixing alpine scenery in the silver of a photographic film the blue haze of distance and the point of view are factors which play an important part. The newer films placed on the market—films less sensitive to the blue end of the spectrum—have helped the amateur in dealing with the first of these. His good judgement must still determine the point of view that will give pictorial value to his work. And then, to wipe away the tendency of distance to dwarf the majesty of mountain peaks, he must cultivate a knack of picking out objects which help to give depth to his photographs.

Air warmed by sunlight that floods peaks capped with snow is certain to produce a blue haze when it strikes the colder currents moving just above a valley floor. Smoke often drifts into valleys, too—smoke from camp fires or the drift from nearby cities. This smoke and haze might seem unimportant in the eye of the photographer, but a camera's eye sees differently.

Giving the quality of depth to photographs of mountain scenery calls for some appreciation of the importance of maneuvering for the proper point of view. The photographer is less fortunate in this than the artist who builds his pictures in oils on canvas—he can devise imaginary objects which the photographer must actually have before the lens. The tramping and climbing this sometimes requires dampens the ardor of many a camera enthusiast so that he lets it go as it is and takes the best picture at hand. Persistence in that hunt gives a reward that is worth all of the effort. Compare for yourself two picture possibilities. The first is a view of saw-toothed peaks crusted with snow, the slanting rays of a setting sun penciling the ridges with gold and rose, darkening the crevices with deep purple—and down at the foot there is nothing to offset the abrupt drop into a valley purpled with the haze of late afternoon. The second is a view of the same saw-toothed peaks at the same time of day, the same valley at the foot. But in the immediate foreground, building a natural frame for the picture, is the rim of a rocky ledge with the twisted arms of scrub pines silhouetting themselves against it. The first picture is flat, unbalanced. The second picture has depth—the monotony of the uniformity of the valley wall is broken by those black, gnarled branches, blackened because the rapid shutter speed so necessary in obtaining a good picture of the distant objects has proven too short an exposure for recording any of their detail. Had a white glacier dipped down into the uniform gray of the valley wall the first picture would have had pictorial value practically equaling that of our second view. But scrub pines are much easier to find than glaciers!

CLOUD PUFFS AND SHADOW SPLOTCHES ADD TO A MOUNTAIN SCENE

Without a filter, shutter speed spells success or failure in this field of photography. Too long an exposure gives too much time for the haze and snow to make an impression on the film—detail is drowned in the whiteness that impression will make on the positive. If the snow of the peaks is to look real and not appear as a white blotch, it must show shadows—its white must not be too uniform—rapid shutter speed must be used.

In Alpine photography it must be realized that the actinic rays of light are more intense at high altitudes than near sea-level. In the mountains the atmosphere does not have the invisible blanket of moisture-laden air to screen out a larger portion of such rays. Short exposures are really longer than one realizes because of this increase in the intensity of light. If a shutter speed of one-fiftieth of a second has been used with a given diaphragm aperture, it would no doubt be advisable to decrease to one one-hundredth of a second the shutter speed in high altitudes, and cut the stop down, too, a small amount.

In considering the position from which exposure is to be made, thought must first be given to the qualities which are to be implanted in the picture. Naturally, in photographs of mountains, massiveness, majesty, grandeur are the desired qualities. Point of view must place the emphasis on these. Suppose that a picture of a mountain peak is taken from a valley floor. Foothills, from such a position, unless the mountain is near, loom up larger than they really should. They are emphasized out of all proportion to the major object. Exactly the same thing is encountered in photographing large buildings from a distance—the smaller buildings in the foreground loom into prominence far out of proportion to their actual relative size.

The best view of a mountain is always obtained from the vantage point of a cliff or a footpath skirting a mountain side. From the valley floor the peak is dwarfed. From the summit of another mountain which is higher it is dwindled again. But from a rocky ledge, neither above nor below, the peak objects on the valley floor are dwarfed as they rightfully should be. The camera is more on a level with the mountain being photographed. (Continued on page 90)

ALWAYS TRY TO FIND SOME OBJECT FOR THE FOREGROUND

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"Fascinating," says *Nature Magazine* in its review of Dr. Fenton's volume, which, written in a quick, interesting, popular style, commends itself at once to readers of layman intelligence. In effect, the author, a professional paleontologist, has lifted the surface from the earth, and from the fossil remains that are thereby exposed, has resurrected those strange and long forgotten animals which roamed the world in an earlier age.

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CAMPER AND HIKER

Published quarterly by the Mountain League of Southern California under the sponsorship of the Los Angeles County Department of Recreation Camps and Playgrounds, *Trails Magazine* has made its bow to the hiking and camping world. Los Angeles County boasts a splendid network of mountain trails of varied length and interest. The new publication contains outlines of these various trips and other items of interest to those who hike and camp. The subscription is forty cents a year. Virgil Dahl is editor.

* * *

Mount Katahdin, Maine terminus of the Appalachian Trail, has long been popular with mountain climbers. The Maine Development Commission, Augusta, Maine, has now brought out an attractive booklet on scaling this peak. It is written by Myron H. Avery of the Potomac-Appalachian Trail Club. Anyone visiting the Katahdin region should have a copy of the pamphlet.

* * *

The Sequoia and General Grant Parks Company is now engaged in the construction and preparation of a camp at Bear Paw Meadow, eleven miles from Giant Forest on the High Sierra Trail in Sequoia National Park. This is the first of several camps planned for the accommodation of hikers and packers traveling this interesting trail to Kern Canyon and Mount Whitney. It will save packing equipment and provisions.

* * *

The Nature Study Club of Indiana has a program of splendid hikes mapped out for this summer season. Indianans should be proud of this splendid group. Get in touch with William Knox, 2401 College Avenue, Indianapolis.

* * *

A newcomer to the ranks of outdoor groups is the Wisconsin Outers of Madison. They are bringing out a monthly bulletin which records an active summer program. During the early fall a canoe trip on the Wisconsin River is planned.

* * *

The roster of the Sierra Club as reported at the recent meeting of its Board of Directors showed a membership of 1996.

* * *

August 5 to 16 are the dates of the annual field trip of the Nature Club of Southern California. The trip will be to Sequoia National Park, where a splendid program of hikes has been arranged. Norman Field Sisson, 553½ N. Berendo St., Los Angeles, is in charge of the trip.

* * *

The twenty-second annual summer outing of the Colorado Mountain Club will be held at Mount Sneffels and the Blue Lakes Region of Colorado, July 29 to August 12.

* * *

The Sky Line Trail Hikers of the Canadian Rockies are entering the second year of their successful existence. A special hike to Yoho Valley is planned in August. J. M. Gibbon, Room 318, Windsor Station,

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* * *

The British Columbia Mountaineering Club extends an invitation to kindred groups to visit the summer camp at Garibaldi Park from August 4 to 19.

* * *

On June 18 the first of the High Sierra hikes in Yosemite National Park left for the high country, and every Monday morning until the middle of August another party will start on the week's trek. Each party is led by a member of the naturalist staff of the Park. The cost of meals and bunk at the High Sierra Camps makes the cost of the week's trip about twenty-five dollars.

NCSES News Notes

Dated May, 1934, *NCSES News Notes* makes its bow. To translate, it is the first issue of a little publication brought out by and for the National Council of Supervisors of Elementary Science. It is a tentative venture and its continuance depends upon the support accorded it by those engaged in elementary science work. The editorial board is headed by Dr. Bertha M. Parker of the School of Education, Chicago University. This first issue contains an excellent article by Dr. S. Prentiss Baldwin in which he pleads for less civilization of park areas. There are other distinguished contributors to the inaugural issue, and various notes of interest to the science teachers. The subscription price of the new publication is seventy-five cents, and Miss Helen Dolman, State Normal College, Ypsilanti, Michigan, is treasurer of the Council. She will welcome three quarters from all and sundry; in fact, she will be equally satisfied with a fifty-cent piece and one quarter.

Everglades Park

By act of Congress authority is now given for the establishment of a tropical National Park in the Everglades of Florida, such to be accomplished through the acquisition of lands by donation to the Federal Government. It is expected that this will require several years. Plans call for the eventual creation of a Park with an area of 2,500 square miles, including Cape Sable. The establishment of the Park will permit the protection of many species of bird life and a wide variety of tropical flora.

New Star Chart

An interesting new star chart devised with the background of long experience with navigation has been brought out by the Ashlock System of Navigation, Commonwealth Building, San Diego, California. Space does not permit our going into details about this chart, but the organization at the above mentioned address will be glad to send further details to interested astronomers, amateur or professional.

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TOO MANY HIGHWAYS

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WILD AREAS BEING RUINED BY INVASION OF NEW ROADS

• • •

THERE is taking place in the United States today a development that it is difficult—perhaps unpopular—to criticize. It is involved with the expenditure of public funds for the provision of employment through public works projects. Such activities are often given tacit general approval on the merits of their fundamental aim rather than their practical application. This may be a careless, even dangerous doctrine.

We refer to the prevailing practice of building roads into and through a wide variety of places, many of which should not be thus invaded. Improvement of highways by making them wider, straighter and safer, or the creation of new highways when there is a legitimate traffic demand for them, are proper uses of such public works funds. Unfortunately we are not thus limiting the road building activity.

There are still in the United States today, despite our national mania for commercialization, many areas the value and charm of which arise from their unspoiled wildness and relative inaccessibility. In many cases these areas are being regarded with eyes that perceive profit or minor political prestige through their being opened up. Pressure is being brought to bear to have highway projects carried forward in places where, under normal conditions, no such demand would be heeded.

There is, for example, agitation for the building of good roads into the Navajo Indian Reservation. Such a program, declares Arthur Newton Pack, "can not but result in destroying the last stronghold of primitive character and balanced contentment of an Indian race."

Roads have been built into areas rich in trout streams and into natural game regions, giving them an accessibility that spells the destruction of these assets as well as the ruin of their charm as wild country. The Jackson's Hole region near Yellowstone National Park in Wyoming is being scarred with roads with no apparent justification other than that they serve to get people from place to place quicker than ever before, and in such a way that they will see less on the way.

Typical of these ill-conceived encroachments is the projected Green Mountain Parkway in Vermont. Along the crest of these mountains, extending from Maine to Georgia, is the Appalachian Trail, a splendid hiker's thoroughfare through mainly wild territory. It is used, in parts, by thousands of men and women every year. Now it is planned to construct a highway which would closely parallel that trail in many places and would cross it several times in the course of a short length of the projected parkway. Hiking with a macadam highway just beyond the trees, or slashing across the trail at several points, is like camping in your own backyard, or swimming with a rope tied to the pier and looped around one's waist.

We have little enough area left where one may approximate the experiences of the pioneer and contest against Nature in its natural state. In some of the National Forests there have been set aside wilderness areas penetrated only by trails essential for fire control. In most of our National Parks certain sections are being kept apart for those who wish to substitute a western saddle for a cushioned auto seat, or who prefer to use two feet clad in sturdy brogues instead of free wheeling and knee action. There is even insistent demand for roads into these regions so that all and sundry may be whisked in by motor, take a quick and careless look and be whisked away elsewhere. There are those who, seemingly, believe that we will not have achieved our proper goal until the crest of every mountain range is scarred by a skyline highway or scenic boulevard. And the large sums currently available have whetted the appetites and given strength to the raucous calls of this element.

We freely concede that the number of those who love Nature and the unspoiled outdoors is much fewer than the number of people too lazy to care for Nature, and too insensitive to its allure to be concerned about its preservation. Nevertheless, we believe that the viewpoint of the former is of infinitely greater value than that of the latter, and that that proportionately higher value vastly outweighs any disproportion in numbers.

Let us use these vast public works sums to aid unemployment and economic reconstruction. Let us so use them that highways may be made adequate to the demands which the development of the automobile today indicates. But let us, at the same time, preserve to posterity those unspoiled areas which are so wisely set aside.

MONKEYLAND IS JUNGLELAND; THE TWO ARE INSEPARABLE. HERE ARE TWO COLOBUS MONKEYS IN THEIR JUNGLE TREE

NATURE MAGAZINE
VOLUME 24 AUGUST · 1934 NUMBER 2

MONKEY NEIGHBORS

BY WALTER J. WILWERDING

ILLUSTRATED BY THE AUTHOR

MONKEYLAND is jungleland; the two are inseparable. This is as true in Africa as in other lands. He who goes in quest of the little monkey people in Africa must follow the water courses, and where the streams flow the jungle follows.

Our first monkey camp was on the Miwaleni River, a crystal clear stream of cold water whose source is in the ice and snow fields of Kibo, mighty mountain peak of Kilimanjaro. Our tents were no sooner up before we heard the harsh "check-check-check" call of the Sykes or blue monkey. These monkeys have a call resembling the excited chatter of our gray squirrel, except that it is louder. From the dense foliage of their tree top homes they had seen our activities and were telling the jungle world of our presence.

In the days that followed we saw many of them, but they were exceedingly wary and, when we approached, would make off with tremendous leaps, shaking the tree branches and making such a rustling sound in their going that it sounded as if a hurricane were blowing through the jungle.

I soon discovered that their wariness was caused by the fact that the Wakahe natives of this district, of whom we had several in our safari, liked the meat of the blue monkeys, shooting them with arrows and trapping them for food. The strange part about this was that these Wakahe would not eat the meat of the Green Guenon or black-faced monkey, nor would they think of eating a Colobus monkey or a baboon. I once asked one of them why they did not eat baboons. His reply was prompt: "They are men."

The monkey in his jungle home is far more interesting than in the zoo. One must see him at home really to know him. Here on the Miwaleni it was a bit difficult to get close enough to study them, but I found that, by sitting quietly on a log near the river, I could get glimpses into their lives.

Early morning and evening were the best times to observe them, for they are actively engaged in feeding right after sunrise and just before sundown. Then they would come to the stream in large family parties to feed on the wild figs and the nuts of the raffia palms. The raffias grow to tremendous proportions on the river banks, sending their giant fronds upward like gargantuan ferns. The nuts of this palm look like mahogany-brown, highly-polished pine cones, having a similar scaled covering, but the inside is hard.

The monkeys like the pulpy covering of the kernel and they do a lot of testing to find the ones that are just right. A monkey will sit on a raffia, pick a nut and bite into it. If it is too ripe, so that the pulpy part is dry, he throws it away and tries another. The ground underneath

OUR TENTS WERE NO SOONER UP THAN WE HEARD THE HARSH "CHECK-CHECK-CHECK" CALL OF THE SYKES OR BLUE MONKEY

the raffias is littered with these nuts that have been nibbled a bit to test them.

One evening I saw a monkey come down to drink. The Miwaleni is far too cold to harbor many crocodiles in its upper end, but now and then one will swim upstream and then the drinking monkeys must beware. This one knew about these lone crocodiles, without doubt, for it came down a submerged branch with the utmost caution, sitting on its haunches when it neared the water and peering all about into the clear depths. When finally assured that no reptilian evil lurked here, it came down to take a few furtive sips and then ran quickly back to peer down into the water once more. It repeated this performance several times until it had drunk its fill.

We shifted our camp to the Ruvu River, near the Pare Mountains, and here we lived in a veritable monkey paradise. We had no sooner cleared a space for our tents in a rather forbidding spot of hippopotamus paths and a riot of wild date palms that whispered of mosquitoes, scorpions and other poisonous things, than the monkeys came in troops to see what the new neighbors looked like.

Here they were apparently unmolested by natives, having absolutely no fear of man. A whole crowd of them clustered about us in the tall fig trees to watch our camp preparations. There were Sykes monkeys by the dozens, a few Green Guenons and a whole party of baboons. We shouted to them and they would start nervously and slap the branches with their little hands, but they stayed to the finish.

The odd part about this assembly was that although the baboons and Sykes monkeys appeared to live in perfect harmony with each other, sitting in the same trees to watch us, the Green Guenons kept by themselves some distance away. One of these little black-faced fellows had a reserved seat in a high yellow-barked acacia. He sat in a crotch, peeping around at us; apparently thinking himself hidden from view. Long after the rest went away to hunt food, he was still in his tree-top roost watching those huge apes on the ground.

We camped under the wild fig trees, which the Sykes monkeys had doubtlessly always used for a dining room, for they came to these trees as regularly as the sunrise. Here they used the same method of picking out their food as those on the Miwaleni, squatting near a bunch of figs and picking the first that came to hand. If the fig was sour, down it came and his monkeyship reached for another.

This was frequently a source of great annoyance to us. These monkeys could see the approach of dawn from the tree tops, long before we in the shadows below and while we still slept they started pelting our tents with figs. "Pom, pom, pom!" down would come the figs on the tight tent tops, and at five in the morning, when

AN OLD MAN COLOBUS OF THE RAU FOREST. THESE ARE THE MOST BEAUTIFUL OF ALL THE MONKEYS WITH THEIR WHITE SILKY MANTLES

one has had a hard time on safari the day before, this is not a welcome performance.

At other times when sketching, I would just be nicely started when "POW" down would come a fig on the top of my helmet. This was quite all right, but when the same thing was repeated on a wet painting it was exasperating. Then I would rise to shout angrily at them. At times they moved off in a hurt manner, but usually they peered down at me as if wondering what all that rude noise was about.

Our personal boy, a Wasibitu with filed teeth, who looked like a gorilla, often came begging me to shoot the monkeys. "See how they have soiled the washing, Bwana," he would expostulate. "They are very bad monkeys." I was sorry for him, but shooting was out, in this camp. As there was no stone in this entire jungle, we had to resort to shouting at them when life became a bit difficult.

Every day or two we had to remove a huge pile of half eaten figs from the top of the dining room tent, for it sagged with the weight and held pools of water when it rained.

In spite of their mischievous ways, the Sykes were the most lovable monkeys we found in Africa. They are also among the most beautiful of the monkey folk. Their hair is rather long and soft and they are black, bluish-gray and olive in color. All four legs are black and the olive color is on the back. Their tails are extremely long and slightly tufted on the ends. They have bushy eyebrows which gives them a serious, thoughtful look. Old men among them are as large as a good-sized, red-faced Japanese monkey and they are always interesting to watch.

A GREEN GUENON, OR BLACK-FACED MONKEY, WHOSE TRIBE SEEMS TO BE EXCLUSIVE AND KEEPS TO ITSELF, AWAY FROM OTHER JUNGLE MONKEYS

THE GALAGO, OR BUSH BABY, IS A LEMUR AND NOCTURNAL IN HABIT, FREQUENTING WOODED PLACES AND ABOUT THE SIZE OF A LARGE FOX SQUIRREL

In the middle of the day, when it was hot, they would sit about under shady bowers of leaves to play and loaf. This was the time of day when they attended to their toilets and the old fellows would stretch out on a limb while their wives went over them for what makes a monkey scratch. Often these diligent mates would pick up the tails of the old fellows and go over them inch by inch to the very tips. When it rained, they would pick out a dense clump of leaves and sit under it for protection.

One never tired watching them at play, the old folks being just as good or better at it than the young ones, who had not yet learned all the tricks. One old chap would jump from a high limb to another perhaps fifteen feet below. For his landing place he would pick a limb that was springy and full of small twigs and leaves, leaping down to bounce up and down for a bit and then climb back to repeat the performance. Sometimes a whole party would jump one after the other.

Another thing they enjoyed tremendously was to jump on a hollow limb near the river. This limb would hit another dead branch when jumped on and make a drum-like sound. The whole crowd would come through the

trees to jump on this limb one after the other to hear the big booming sound. After they had all jumped, they would come back and repeat. There was another drumming limb in another part of this jungle where I have seen them do the same thing, so I know they were doing it for pure fun.

One of these drumming branches was in plain sight of our dining tent and often when seated about the table we would hear a repeated "boom, boom, boom," and look up to see the monkeys jumping on the branch one after the other.

Monkeys have regular roads through the tree tops. When coming to feed, going to water, or to roost, they would always follow certain routes, going through the same trees and on the same branches. After becoming acquainted with this habit of theirs, I had simply to go to these places to watch their comings and goings.

There were two distinct jumping places, or aerial bridges, near our camp. One such place was over an open spot in the forest and the other over the Ruvu. Both were jumps of from twelve to fourteen feet, but they made these jumps with ease, sailing gracefully through the air like trapeze performers. The tiny ones weren't quite so graceful, for to them the jump was a long one. They would come hurtling through the air to grab frantically at leaves and twigs with all four feet. None dared miss at the Ruvu crossing, for the Ruvu is slimy with crocodiles and a miss meant a missing monkey.

A bit before sundown they would come to the high fig trees to hunt roosts for the night and soon every crotch held its dark, furry bundle. Then the baboons also came, but these never came without much noise. The little baboons would come along crying and screeching like many peevish babies. When the racket became too much for the old dogs, these would bark a hollow, booming order for quiet.

This hollow barking of the old dog baboons was one of our African alarm clocks, for they always bark just before sun-up. Then the whole troop would go away to the inhospitable rock- and thorn-covered slopes of the Pares to grub for food. At times they made considerable excavations in their hunt for roots and grubs. These baboons look much like the chacma of South Africa, but are a trifle lighter in color. The old dogs are huge beasts with formidable fangs; swaggering brutes who look as if they might be dangerous if cornered.

There was always a guard of old dogs in the front and rear of every traveling troop, which often numbered fifty or more. These guards would climb up on ant-hills, stumps or small bushes to watch us. Natives say that they post guards when feeding and if the guard deserts his post and harm comes to the troop, they will tear the miscreant to pieces.

The natives of this district believe that the baboons were once men whose homes and gardens were destroyed by enemies, and that they have never been able to decide on a day when they will again build houses, raise crops and be men. They say that if you will listen closely you can hear the baboons calling: "Tomorrow we will build houses!" But always on the morrow they call the same thing and the houses are never built.

On windy or rainy nights the baboons always made a great fuss in the fig trees near our camp. Old fellows with rheumatism would complain all night when it rained, and when strong winds caused those on insecure roosts to hunt new ones in the night, so that other baboons would be routed out or disturbed, there would always be high words and much bad language.

Little baboons are exceedingly cute. Often, when I was sketching or fishing on the Ruvu banks, they would come in parties to look at me, which would exasperate their mothers, who would call to them from a safe distance. One could almost translate their calls: "Johnny get away from that bad man!" But the little fellows always had to have their look at the big baboon before going to mother. They look very comical with their dark faces and light eyelids. Some think that they signal to each other by flashing these eyelids, but I doubt this. They seem to have a grunting understanding with each other. One will grunt and the other will grunt in answer, and so they seem to converse.

At night we had other visitors in the fig trees over our camp: the little galagos or bush babies. These are lemurs and are nocturnal in their habits. One finds them in most wooded places in Africa. These on the Ruvu were about the size of a large fox squirrel. They are dull grayish-brown in color, have soft fur, large naked ears and beautiful, big, lustrous eyes. They have hands and feet like monkeys, but the first toe of the foot has a claw like a bird. Thumbs and great toes are quite long.

They sleep in hollows in trees, birds' nests or in the crowns of palms during the day and become active at sundown. Then they climb through the tree tops to catch roosting birds, insects or lizards and vary their diet with fruits. They pelted our tents with figs when the monkeys were off shift.

They have an odd call that sounds as if they were in agony or had been caught by the leg and wanted help. The call starts low, comes to a high pitch and then trails off. One calls: "Ka-ka-ka-ka-ah, ka-ka-ka-ka!" and another answers. At times one will call a single note: "Kah!" and another will answer in a higher or lower key. They are said to go about in pairs and these are no doubt the mates keeping track of each other's movements. We would flash their eyes with a flashlight and their eyes would shine back ruby-red from the branches above.

But the most beautiful monkeys of all the world are the Guereza Colobus of the deep forests of Africa. They have marvelous contrasting fur of black and white; the white falling in a silky mantle from the shoulders to meet the long, wavy, white hair of the tails. Their black faces are ringed with white and they have black, erect pompadours. The thumbs are present in only little wart-like nubs, but they have five toes on the feet. Some old males are almost as large as a male baboon.

We found the Guereza on the Miwaleni, on Kilimanjaro Mountain, where the nights were bitterly cold, and down in the Rau forest. Here they live in the moss-

draped rain forests, never leaving their jungle homes to raid native gardens.

The old males jump from limb to limb with their white mantles and tails waving gracefully, like the drapery of the butterfly dancers of other days. At each jump they call their crooning "Ah-roo-roo-roo!" which resembles the burring of huge frogs when heard at a distance. The call is heard oftenest in the early morning. One after another takes up this call until the branches are full of dancing monkeys and the forest echoes with the crooning notes. The dance of the Colobus is well worth the voyage to Africa and the trip to Colobus land.

I was once with a man who collected a male and female for scientific purposes. I walked over with two Wakahe natives to see his monkeys. The two blacks, who thought nothing of shooting and eating a blue monkey, looked sadly at the two Colobus and one remarked: "These are not things for a man to kill, for they stay by themselves in the forest and do not come into the shambas of man." I, too, looked sadly at the two beautiful creatures, never again to dance in the tree tops, and agreed with these primitive blacks: "These are not things for a man to kill."

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LITTLE HOUSES OF SILK

BY J. S. WADE

PHOTOGRAPHS BY L. C. PINTEN

INTERIOR OF A SPIDER'S NEST CONSTRUCTED IN A GRASS BLADE

ALL THOSE who enjoy the out-of-doors and who love to observe our "little neighbors of the fields" will find few exhibitions of instinctive skill any more wonderful than some of the spinning work of spiders. Excellent examples of this beautiful and infinite variety to be found in Nature are some of the varied forms of spider nets made by folding or rolling a leaf or leaves and lining the enclosed spaces with silk. Nests of such type are made by the tube-weavers, by some of the crab-spiders, by some of the jumping spiders, and by others. Some, though not all of these, also build webs. Close observation of them has shown that several of the web-building spiders have no definite retreat, but, when disturbed, they merely run away from their web or drop to the ground. Some of them, however, do build a nest near their web for a retreat, or from which they can keep a sharp lookout for their prospective victims. Curiously enough, some of the spiders, notably the funnel-web weavers, prepare a long silken tube or funnel, so arranged as to form this necessary passage-way, through which they can come and go in greater security. Sometimes the nest is built above or at one side of the web, and with a skillfully arranged connecting trap line leading to the center of the orb. By means of this any disturbance in the web is noticed at once by the waiting spider, and, if some unfortunate creature be entangled therein, then down it rushes to secure its prey. The retreats of the young of a number of the species are composed entirely of silk, whereas when they reach the adult stage they merely make use of a folded leaf or of a tiny bunch of leaves. All these things are not wonders the seeing of which requires long expensive journeys to far away lands, but they are marvels to be observed right at home by anyone who has eyes and will take the trouble to see. Just look closely in woods and fields and see how many different kinds of homes made by the architects in silk you can discover on one brief outing.

AN ODDLY FOLDED BLADE OF GRASS THAT HOLDS A SPIDER'S NEST

A CLOSE VIEW OF SNAKEROOT
Showing the tips of two of the wand-like racemes of the plant

BLACK SNAKEROOT

AN ILL-NAMED MEMBER OF A BEAUTIFUL PLANT FAMILY

BY F. LAMSON-SCRIBNER

PHOTOGRAPHS BY THE AUTHOR

THE CROWFOOT Family contains many well-known and interesting plants, ranging from the buttercups that spangle our meadows with the brightest gold, the lovely clematis, the charming columbine, and dainty wind flower, to the royal and colorful peony. But among them all not one is more graceful or more suggestive of woodland fairies than our *Cimicifuga racemosa*—black snakeroot is too ugly a name to use here—that grows closely along the borders of rich deciduous forests from Maine to the Mississippi and southward to Georgia. Half concealed by surrounding undergrowth, it stands throughout the midsummer months like a fairy sentinel waving its ornate wands with every zephyr as if inviting all who pass to enter the cool and shady forest depths within.

Black snakeroot is a hardy perennial with thick knotted root-stocks, upright stems three to eight feet high, leafy below; flowers, white, very numerous in slender, distinctively feathery wand-like racemes one to two feet long, projecting far above the handsome decompound leaves; stamens innumerable, a hundred or more in each flower. The fruit is a brown, dry, oblong dehiscent corrugated pod, about one-fourth of an inch long filled with two rows of compressed dark brown minutely roughened seeds.

When in bloom the plant is decidedly ornamental and is well suited for backgrounds to border cultivations.

A FAMILIAR MEMBER OF THE CROWFOOT FAMILY
Black snakeroot grows closely along the borders of rich, deciduous forests from Maine to the Mississippi and southward to Georgia

It may be propagated by seeds or root cuttings. There are about twelve species of *Cimicifuga*, chiefly ornamental.

THEY'RE GETTING OUR BIRDS!

BY MILDRED GARNER

ILLUSTRATED BY R. BRUCE HORSFALL

What of the stray cat, whose number is perhaps eighty million and who takes a terrific toll of bird life every year? In this article we have an excellent discussion of this question. It is a subject which merits thought and study in the civic interest as well as in the interests of wild life conservation. We have here no sweeping condemnation of cats, merely a plea that the homeless cat be given a home or the mercy of extinction.

THE SUN had been down for an hour. Our combination bird-bath and cafeteria had been deserted for some time when we heard that sound—a low, soft chip in the shrubs beneath the window. It was our neighbor, the male cardinal, returning in the friendly darkness for a few remembered sunflower seeds. I went to the pantry window and watched him, a dark splash of red in the dry grass as he scratched at the seeds, raising a cautious head after each one, and voicing that low, sharp little note.

Suddenly I became aware of something in the hedgerow near him. It was not that the shrubbery moved because a stray cat will crouch for an hour, scarcely moving, for such a capture as this. But I saw her gray coat, the gleam of her eyes in the darkness. I shouted a warning to the bird, and breathed a sigh of relief as he lifted his crested head and flew a few yards to the bird-bath. Then—a flash of gray fur, a scream of terror, and the red bird was in the claws of the cat. She had made a six-foot leap from the ground! I ran into the yard and gave chase, but, although I saw the cat and heard the weak trilling of the bird in her mouth, I could not catch her. She disappeared through a hole in the fence, and as she ran, the cry of the cardinal was silenced forever. Two of his scarlet feathers lay in the bird-bath for days, a mute reminder of lost glory.

It was then that we thought of protecting our birds, and learned the appalling figures of bird destruction by stray cats in America. We had been watching the birds for weeks, seeing them fly, screaming, to safety, whenever a stray cat from the alley wandered in. We had been taking the whole situation for granted, like the other millions of bird-lovers all over the country. But we are more interested in birds than we used to be. We find in their movement and song some contact with the life of the open field. We are all trying as individuals and as garden club members, to create or to coax beauty into barren places, and how we do need birds on our tiny lawns in the city! A tree, a seed-bearing shrub will attract them to the poorest garden, the barest house. A ten-story apartment house stands in view of my window, and I have often seen a mocking-bird perched on the sooty chimney of that building, singing as if the roofing pebbles were pine needles, and his chimney the highest tree in the forest. He is shouting his gratitude for the daily supply of crumbs on an improvised feeding shelf in one of those windows. I have heard four cardinals in a single bare tree in our yard blend their trilling, whistling and rolling song in a perfect quartet of joy to the sleet on an icy morning in winter. For three years we have watched

robins nesting in a corner of our house, close enough for us to hear the chirp of each fledgling, and see, at close range, the drama of the first perilous flight. We have chewinks, four pairs of them, calling us to get up each morning; urging us to throw peanuts out the window. They join the cardinals in this demand for peanuts, mentally stamping their feet with impatience. After their peanuts, we watch them take their baths, the males first, as befits the head of the family, then the less brilliant wives. We offer no attractions except a scrap of a garden, daily food and protection from cats.

This protection was not easily accomplished, because we did not know whom to consult about the problem. We hesitated a long time, too, reasoning with ourselves that the stray cat had a right to live. The Humane Society had one answer for that plea: "Such cats are better off dead." A careful survey of the alley revealed fifteen vagrants of all colors, sizes and conditions. They were mangy, they were hungry, they were indescribably dirty. Three kittens were in the lot, gaunt little creatures with sharp bones pushing through the fur at their haunches. In an effort to dispose of them, we called the Humane Society, the local Game and Fish Department, the local Universities, and wrote a letter to the Government. We found that all these organizations were strongly in favor of the destruction of vagrant cats, and were prepared to give assistance.

Quoting from the Bulletin of the U. S. Department of Agriculture: "Vagrant cats are usually hungry, mangy, and diseased, and quickly revert to wild habits and characteristics. They are rapacious, cautious and unsocial. They mingle with valued cats and contaminate them by transmitting disease and parasites, and have been known also to disseminate disease among human beings: [Diphtheria, paralysis, tuberculosis]. They become skilled hunters and seriously menace song, insectivorous and game birds, rabbits, squirrels . . . and poultry. As a measure of public safety and to assist in conserving valuable birds, and as an act of mercy to the cats themselves, all unowned cats should be destroyed."

TWO THIRDS OF ALL THE CATS IN AMERICA ARE STRAYS AND IT IS ESTIMATED THAT ONE SUCH CAT WILL KILL FIFTY BIRDS ANNUALLY. THERE ARE ABOUT 120,000,000 CATS IN THE UNITED STATES

In the weeks following our receipt of this bulletin, we had extensive experience with the strays that call our alley Home. We looked in upon them at all hours of the day, and uncovered the details of their private lives. We find that they divide their daylight hours between the bird-bath and the garbage, dropping off for an occasional nap on the rock garden plants or under the house. Stalking birds is their chief vocation, and to the pastime they bring unbelievable patience, crouching for cramping hour after hour, watchful, alert, silent, while the birds chatter their joy in the sunshine. A tiny quail chick, on his way from the shell, will chirp loudly enough to attract any cat that might be nearby.

But the vagrants come into their own at night. Lives there a man or woman who has not tossed in bed through the lonely hours of darkness, listening to sounds more desolate than any other in mortal experience! A sound so human and yet, less than human. A glance into the night will reveal a couple of ordinary cats facing each other, with backs arched, fur standing on end, and tails at an ominous angle. A fight (or a courtship) is usually forthcoming, after which the party breaks up, and the cats venture forth in search of animals small enough or helpless enough to be eaten. In city yards, these will be birds, asleep or wakefully guarding their nests, chickens of all sizes, pigeons and pet rabbits. In outlying sections, there

will be quail, asleep or nesting on the ground, small turkeys, ducks or other poultry. The cats will spring upon their victims, kill them, after a long process of slow torture, and eat a few bites from the tender breast. For this morsel, and the joy of the kill, a stray cat destroys a bird like the cardinal! Returning to the alley, the vagrants rifle garbage cans, turning them over and scattering the contents. A last stroll or two around the premises and they are ready for their early morning nap on your porch glider. On one of these early strolls recently, our "hero" captured a grown hen and carried her, squawking loudly, to his favorite hideout, before he curled up in our swing and went to sleep. He was a powerful fellow, exotically clad in a gray and brown and black suit four inches long in some places and eaten down to the skin in others.

A STRAY CAT WILL CROUCH FOR AN HOUR, SCARCELY MOVING, FOR SUCH A CAPTURE AS THIS

It is because stray cats are most active at night that the average person has no idea how numerous they are. They are with us now to the extent of one cat to each person. Two-thirds of all the cats in America are strays, and John Burroughs estimated that one such cat will kill fifty birds annually! Among these will be our best singers, cardinals, thrushes, vireos, mocking-birds, our bright tanagers and bluebirds, our friendly robins that are gathering now in conclaves on the lawn. The brilliance that attracts us attracts also their worst enemy. So greatly has Nature's balance been upset, many species of bird are definitely on the decrease, and naturalists are constantly fearful for the continuance of certain varieties. Nor are game birds immune.

These 120,000,000 cats are in a strange position, quite outside the rule of the forest. They hunt but are not hunted. They kill but are not killed. There is nothing to stop their frightful depredations unless we do.

I have the feeling that women, working individually or in groups, can do a great deal in solving this problem. The thing is so simple. If we want birds in the garden, we must protect them. Surely all garden clubs will want to do their part in locating these vagrant animals, and destroying them, for birds are Nature's insecticides. The small brown sparrow that "Chip-chips" in your garden all day will eat aphids at the rate of thirty a minute, and keep at the job for hours. Someone has seen him do it, watching him as he ate the plant lice, and keeping score! Aphids, beetles, ants, chinch bugs, boll weevils and caterpillars are each preferred tidbits to one or more varieties of birds. Insect life, a constant menace to all other life in the world, is in part kept under control by birds. If we lose them, we shall lose also many of our flowers, our vegetables and our trees.

The situation has become critical. Something must be done about it, and for our purpose, there could be no better solution than the cat trap described minutely in the Bulletin of the Department of Agriculture: *How To Make A Cat Trap*. It is a simple plan—trapping stray cats —and will end forever, the cruel and risky attempts to poison the offenders. We must remember, always, that a pet cat is as greatly loved by its owners as any bird could possibly be. One dark hour of my childhood was the hour

that we found our pet tabby, poisoned and dying, in a neighbor's yard. The government plan is designed especially for cats, and, if the trap is baited with dried catnip or, better still, oil of catnip, it will have no attraction for dogs.

You may chloroform the captured animal by slipping a cloth immersed in two ounces of chloroform into the box, and covering the box with a blanket. Or, you may tie a burlap bag over the door end of the trap, slip the door open, and, with the cat in the bag, tie the top securely. You may then give it to the Humane Society, if your town has one, or to some similar agency; or you may follow the advice of the Bulletin, and drown the animal. The pain and prolonged distress of a death from natural causes is far worse than any of these.

Garden Clubs might undertake this activity by appointing a chairman who would see that the trap is constructed and set in a good location, and the animals later disposed of. A small fee for each one will secure assistance from someone who is not afraid to handle the half-wild captives. And, when the situation is felt to be controlled, there are three things everyone can do to prevent a recurrence:

First, see that all waste food is placed in a covered container. Live food forms a small part of the stray cat's daily diet. All of them are keeping alive on food scraps thoughtlessly left uncovered.

Second, tie a bell around the necks of all pet cats—a plan recommended by all authorities. This will make it impossible for the cat to stalk a bird with the necessary stealth.

Finally, never, under any condition, abandon your pet cat when you move to a new location. All stray cats are abandoned house cats, or their offspring, that have been left unfed by their owners and are thus forced to gain a precarious living by hunting and by scavenging in garbage cans, on dumps, and in similar places. If you cannot give the pet to a friend, give it to a Humane Society that will keep it until they find someone who wants a pet cat. No one wants a vagrant, or would wish to be a vagrant.

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A HUMP-BACKED TURTLE

BY PERCY BELL, II

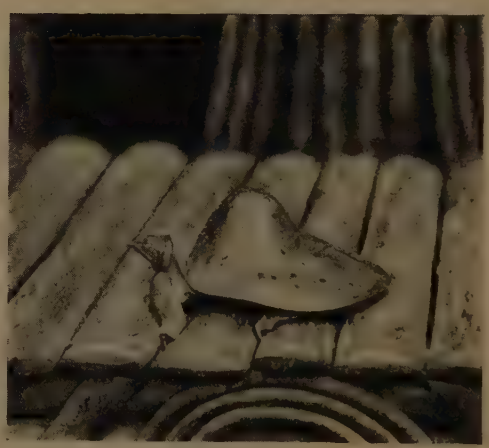
"HIT'S de wuck ob de debbil! I's a-gwine to hab bad luck f'om now on!" It was a terrified shout from an aged negress, fishing on the bank. Expecting anything, I hurried to her. She had caught a middle-sized soft-shelled turtle, obviously deformed. He had a large hump in his back.

"You needn't be worried," I said. "The only harm he can do is to bite you, and he can't do that if you are careful. He probably broke his back when he was little, and, in healing, it grew back that way."

"Does y'all want 'im?" she inquired hopefully.

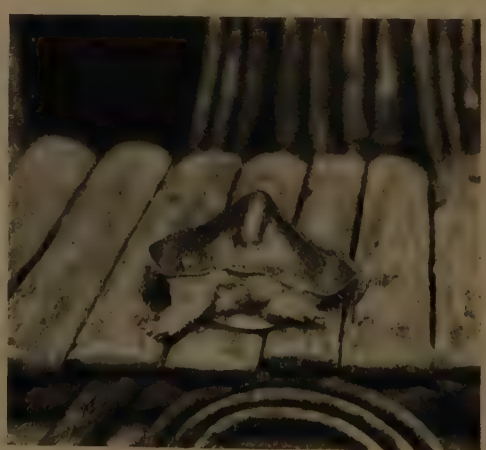
"Yes, indeed!" I replied. She handed over the line, not willing to touch the turtle. I took him, loosed the hook from his mouth, and returned her line, thanking her. She mumbled something about being glad to be rid of the curse.

After Dad and I had caught a rather nice string of crappie and a few catfish, we took our turtle home. From the attic I salvaged a large aquarium and put in it about two inches of sand. Then I poured in enough water to cover the turtle, and added more sand in one end to make a little beach. With some bread and meat and about ten live, fairly large top minnows, I thought everything was ready for the occupant.



HUMPY IN PROFILE

Side view of the deformed turtle with a head-on view of him shown below



I put in the turtle, ready to see him eat. But his first act was to stick his head in the sand, and, shoving with all four feet, he buried himself all except his hump, which stuck out almost an inch above the sand. Other turtles of the same kind bury themselves all the way under. Evidently he did not know that he had a hump!

He stays there most of the time, sticking out his nose for air every once in a while. Occasionally, however, he comes all the way out to eat some bread or meat. He always reburies himself. He never tries to escape, and seems perfectly happy.

I think that when he was young he broke his back by some accident, and that it healed in that camel-like way. He is perfectly normal except for his hump; and has grown to be about five inches long with his head pulled in. And he never seems to worry about his narrow escape from death.

A DISTINCTIVE WILD IRIS
This is Iris tenuis and it is found only in the limited area on the western slope of the Cascades

A NEWLY-NAMED SPECIES
This is Lewisia heckneri, an attractive plant with curious fleshy teeth on the margins of the leaves

RARE AND UNUSUAL WESTERN PLANTS

BY IRA N. GABRIELSON

THE VORACIOUS PITCHER PLANT
The sinister hooded leaves of this plant carry death for many a luckless insect attracted by its odor

AMONG all the plants of the West, interesting because of their oddity or unknown because of their remote habitat, none are more bizarre in appearance than the California pitcher plant, *Darlingtonia californica.* The swampy places of the Siskiyou Mountains are often a stiff top-heavy forest of its sinister yellow-green hoods, which carry a lurking death threat for many unfortunate insects. These great hollow tubes with expanded cobra heads carry a faint carrion odor to lure the unwary flies and beetles toward the trap mouth. The entrance is located directly beneath the curl of the hood, and is guarded by two wing-like appendages that serve to guide the crawling victims more surely into the trap. Once inside and started downward, there can be no turning back for the doomed insects. The inside of that tubular leaf is lined with long, soft, silky hairs, all pointing downward. They furnish no secure footing to stay the descent of the struggling victim, and rise to bar the way for any return up the sloping walls. The insect, be it fly, beetle, or wasp,

OLYMPIC MOUNTAIN FLOWER
Campanula piperi, least known and most beautiful of American bellflowers

quickly slides or falls into the fluid in the base of the leaves, where it furnishes nourishment for this flesh-eating plant. In keeping with the sinister pitcher plant's habits, the blossoms are barbaric combinations of greenish yellow and dull brownish-red, and are held on long naked stems above the clubbed forests of yellow-green leaves. Of all Siskiyouan plants this is the first to attract the attention of any one entering its chosen habitat.

In the old sphagnum bogs at the westward base of the Siskiyous, now thickly grown with azalea, waxmyrtle and Labrador tea, is found the rarest of native American lilies. The Eureka lily, *Lilium occidentalis,* grows about the base of the smaller shrubbery where its bulbs are shaded and yet where its wand-like stem is able to carry the much recurved nodding flowers into the sunlight. In the best color forms it is a deep, dark red, while the poorer ones shade off toward the orange reds that are so common in the family. Unlike many rare plants that are abundant when one reaches their chosen home, this lily is by no means common in any locality. It grows along the coastal strip from Humboldt Bay on the California coast to Coos Bay in southern Oregon, and is to be found there only in widely scattered colonies. The Eureka lily is the darkest red of any native species, and as such has considerable garden value. It is now growing in a number of gardens on the Pacific Coast and is doing surprisingly well, when its restricted natural range is considered.

Far up the coast from the Siskiyous on the northern ramparts of the Olympics are two other rarities as yet seen by comparatively few Nature lovers. *Campanula piperi,* least known and most beautiful of North American bell-flowers, is one of these. It is found near timberline, where it grows as a true crevice plant, outlining the fissures in the face of the cliffs with tight rosettes of dark green prickly evergreen leaves. When summer comes each of these fissures becomes a miniature wall garden decorated with the pale blue, wide-eyed stars of this rare campanula. The beauty of the flowers is enhanced by the dull red glow of the great club-like pistil as the blossom reaches maturity. *Campanula piperi* is rare in the sense that it has a restricted range. It is found only in the higher parts of the Olympics, but here it is one of the abundant cliff plants, decorating every crack and fissure for miles along the summits.

Henderson's spiraea, *Spiraea hendersoni,* is the second of the Olympian rarities to which this range has exclusive claim. It is also a crevice plant, even more alpine in its preference than the campanula that is often its boon companion. The spiraea is a woody little plant crawling along the face of the rock by stiff whip-like rootstalks. The dark green leaves are grouped closely about the ends of the small branches to form a green background as a foil for the small spires of pale yellow blossoms that

A TRULY RARE LILY
Lilium occidentalis is not common in any locality even within its natural range

RARE CREVICE PLANT OF THE OLYMPICS

Spiraea hendersoni has a limited range. A dwarf pentstemon is blooming in the center of the group

appear in abundance in July. On the higher points great festoons of this showy creeper effectively decorate the faces of the cliffs with tapestries of pale yellow and dark green.

Wide leaved *Iris tenuis*, one of the most local of American irises, grows in a restricted area on the headwaters of certain branches of the Clackamas River. Here in the western foothills of the Cascades conditions have favored the development of this woodland species. In the gravelly stream bottoms beneath the shade of mixed coniferous and deciduous timber it sends the wiry rootstalks rambling far and wide, occasionally pausing to form a cluster of feeding roots and to send up a few leaves together with a flower stalk. Each of the flowering stems produce two soft creamy yellow blossoms, the falls of which are marked with a golden splash and a network of purple.

The latest evergreen lewisia to be described, *Lewisia heckneri,* is at home on the rocky shoulders of the Trinity Mountains in northern California. Here it grows forming tight rosettes each thickened leaf of which is edged with a multitude of small fleshy teeth, and in this respect is totally unlike any of its relatives. The open heads of flowers, each long white petal carrying a longitudinal strip of bright pink, rank among the most conspicuous of western blossoms. Like others of its tribe *L. heckneri* likes some shade, growing most luxuriantly where it can be at least partially protected from the noon-day sun. It was named in honor of J. H. Heckner, the keen-eyed woodsman who first found and sent in specimens of this novel development known, so far as present understanding goes, only from a restricted area in its mountain home.

THE MAMBA—A BOGEY

BY DR. WALTER ROSE

William Beebe, in one of his delightful books, draws attention to the human fondness for constructing a bogey from straw and paper, filling it with hot air and then running screaming away from the figment of our own imaginations. The tiresomely over-dramatized mamba may be regarded as such a bogey. Probably no writer of South African romance has been able to resist the temptation to expatiate on its deadliness, its activity and its demoniac ferocity. Deadly it certainly is, being a front-fanged colubrine, and in activity there are probably few snakes to equal it; but it cannot be regarded as ferocious, being indeed an extremely nervous creature. It is well known that snakes have no ears, either external or internal, being made aware of one's approach from the vibrations on the ground being felt by the nerves of the under surface. Tree snakes like the mamba are thus more likely to be surprised at close quarters by an intruder, when from sheer fright they are prone to strike out in self defence. Despite this circumstance, deaths due to mamba bite are rare. Rhodesia, largely bush country with a big native population, is its chief haunt, nevertheless an official report for 1930, analysing the 350 deaths that occurred from violence, gave ten resulting from snake bite (mambas, puff-adders, cobras, etc.). Other figures were: drowned, nineteen; killed by lightning, eleven; by crocodiles, twelve; by lions, elephants, buffalos and rhinoceroses, one each; by domestic cattle, six; suicide, 61. So much for savage South Africa. During the same period more than 8000 persons were killed by motor cars in the streets of London, a dangerous spot.

SHE PUT HER BILL INTO HIS, HOLDING IT TIGHTLY AND PUMPING HIS HEAD UP AND DOWN VIGOROUSLY

LORD AND LADY PIGEON

BY

MERTON S. YEWDALE

ILLUSTRATED BY R. BRUCE HORSFALL

ONE DAY while I was sitting at my desk in the office, my eye was attracted by something moving on the ledge outside of the window. I looked, and there were two pigeons walking by in Chinese fashion—one in front of the other. They both looked toward the window; but when they saw me watching them, they fluttered and hurried by.

The next morning I brought some shelled peanuts and strewed them on the ledge, in sight of the two pigeons who were on a building across the street. I could see them conferring. After a little hesitation, they winged over and in a few minutes the peanuts were gone, gulped down. I continued to put peanuts out every day at the same hour and with the curious sense of time which birds and animals have, they were always around and expectant.

When they had got used to my watching them, I ventured to raise the window and offer the peanuts in my hand. At first they were nervous and walked up and down at the edge of the ledge, and now and then in circles, but always watching the peanuts. The male pigeon, the larger one of the pair, was the more venturesome, and two or three times approached valiantly but lost his courage when I extended my arm. "That's a good boy," I said, "come and get your peanuts." The little female timidly stood away and watched. Finally, I drew my hand back, which was too much for my Lord Pigeon. He saw the peanuts receding so he darted forward and seized one—and then another, and another, until they were all gone. I closed the window.

Then I noticed a strange thing: Lady Pigeon put her bill into Lord Pigeon's bill, holding it tightly and pumping his head up and down vigorously. He tried to get away by stretching himself high into the air. That failed. She still hung on. Then he crouched down low, but he was still a prisoner. After a while she let him go. But no sooner did he get his breath than she was at him again—and again. Then they flew away for the rest of the day.

One day Lady Pigeon had evidently got tired of seeing her lord gobble all the peanuts while she looked on. She was excited, and walked back and forth to the side, all the while edging a little nearer and back of her mate. I could see that she was contemplating some stratagem. Yes—there it was! All tense, she watched him, and the moment he grabbed a peanut, she seized one too, and retired quickly to the distance of two wing-flaps, a little timorous but plainly pleased at having burst through the stronghold of her fear. After that, Lord Pigeon had to share his peanuts.

But after each feast Lady Pigeon regularly seized her lord's bill, and up and down bobbed the two heads, which still had me puzzled. One day we had as a visitor a Cheyenne Indian woman, who watched the pigeons fondly and understandingly. "Don't you know," she said when I asked her, "that the female is getting some of the peanuts he ate! He didn't swallow them completely. They went into a little pocket, and that is the way he can take the food back to his mate when she is sitting on the nest, hatching the eggs."

A prettier pair of pigeons could not be imagined. He is a gorgeous color of slate-blue and white, with a mass of purple around his neck and tinted with green. She is of a delicate grayish white, with a charming violet-green collar around her neck; and her tail feathers are fluted and gray. Frequently I see them standing side by side on a jutting corner of the building across the way, looking up into the sun as though in a spirit of adoration. Where he goes, she follows; and every day they fly back and forth through the canyons made by the buildings. The place of their nest, I don't know. It is a secret.

But they have another secret to keep. Less than a block away is the meeting place of at least a hundred pigeons, and I have often wondered why some of them have not found their way to the peanut ledge. Birds have a language of their own and as a rule tell each other where there are

good feeding places. I am certain that Lord and Lady Pigeon want to keep the peanut ledge a secret, not only because the large flock of pigeons do not come, but because of something I saw, which was extraordinarily clever and at the same time proves that birds can think and reason. I had put out some peanuts and the pigeons were watching on the opposite building. But they did not come. They were uneasy and kept turning to each other as though they were discussing a matter that was agitating them. I looked out and saw a third pigeon flying around, which the pair watched disapprovingly. In a moment, Lord Pigeon flew down the street, leaving Lady Pigeon sitting motionless and waiting. The stranger started to fly after him, but changed his mind and circled back. In a flash, Lady Pigeon darted into the air, the stranger following. After about an hour the pair came back and flew right to the ledge. I looked out and the stranger was gone. In some mysterious way, they had lured him away and lost him.

AT LAST HE SAW HER IN THE AIR AND HE SHOT UP LIKE A SLATE-BLUE ARROW

Their fixed time for coming is around noon; but frequently they come also in the early morning and middle afternoon. Most of the time they come together, and it is plain that much of Lady Pigeon's courage to eat out of my hand comes from the presence of her lord. In mating time, when one of them has to stay on the nest, Lady Pigeon is very shy when it is her turn to come. The first day that she came alone, she looked in the window and then when I opened it, moved to the edge of the ledge, eyeing the peanuts in my hand. She walked up and down in the friendliest fashion, but capriciously kept out of reach. She would not come up to take the peanuts, but neither would she fly away. I threw the peanuts on the ledge and closed the window. Without a moment's hesitation, she ran toward them and ate them as fast as she could. Then she came to the window to ask for more—and she got them.

One day I was a little late in noticing her and she flew in a huff to a distant building diagonally from the corner. The moment I got up and stood before the window she saw me and in a long, graceful, undulating curve she sailed up to the ledge even before the window was wide open.

Lord Pigeon is very fond of his mate. Once when she flew away before the peanuts had all been eaten and he remained to finish them, he could not see her when he was ready to fly away; so he sat down low and looked up in the air and toward the window, and tops of the buildings in the hope of spying her. He even looked straight upward to see if she was sitting above him on the top of the building —and there was an unmistakable look of anxiety on his face. Then when at last he saw her in the air—O joy! —and he shot up like a slate-blue arrow.

Little by little he becomes more confident and he understands what I say to him. When I praise him and tell him he is a pretty boy, he straightens up proudly and shows plainly that he is much pleased. Occasionally, he gets temperamental like his lady and struts around archly, as much as to say, "Maybe I'll come for the peanuts, and maybe I won't." When he keeps it up too long I say, "Now stop your fooling. Come over here. No more nonsense"—and he walks right up as obediently as a little soldier. Sometimes if I am too slow opening the window, he flies up against the pane and tries to stand on the narrow frame of the window so I will see him better.

Lady Pigeon remains a little shy and nervous. On one occasion, a stranger to her stood near the window to watch. She knew in a minute that it was somebody she had never seen before and she became alarmed and flew away, whereupon I asked the visitor to move to the side. Lady Pigeon then flew toward the ledge and was just about to light when she caught sight of the stranger standing in the corner. She wheeled immediately and did not come back again that day.

It is mating time and I know that somewhere there is a nest with eggs in it, because the pigeons take turns in coming to the ledge. They are very serious, as though they were aware of their responsibility. I am anxiously waiting for the time when Lord and Lady Pigeon bring their fledglings to the ledge to make their first visit.

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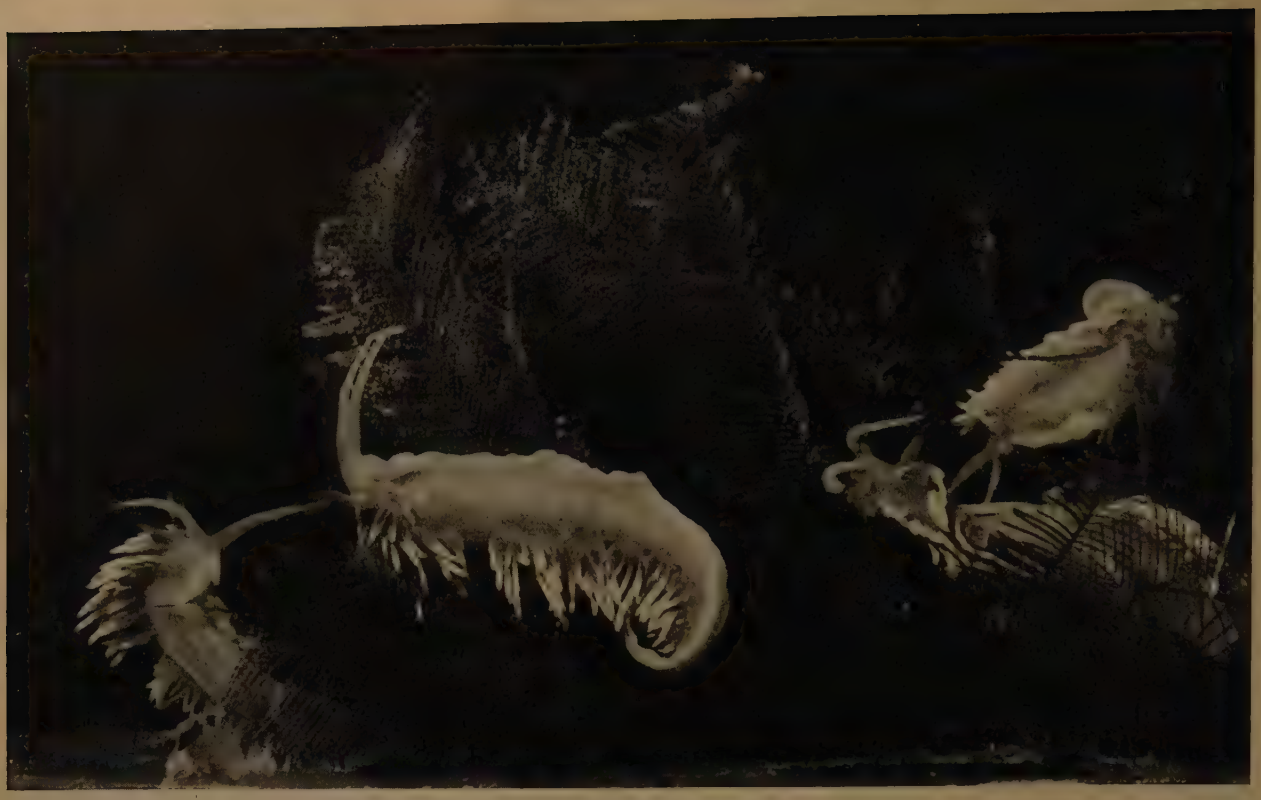
SOMETHING NEW IN OCTOBER

Lest it take the edge off the surprise we will not go into details, but with the October issue we will inaugurate a new feature in the pages of Nature Magazine, one which will, we are sure, be welcomed by every reader. It is a departure which we have long wanted to make but which has not been hitherto possible. So do not miss the October issue and after you have seen it please let us know how you like it.



FLABELLINA IODINEA, ONE OF THE LOVELIEST OF THE NAKED MOLLUSCS

These graceful creatures, with their purple bodies and bright orange gill fringes, must be seen to be fully appreciated. They will grace the home aquarium collection

BRINGING SHORE LIFE HOME

BY WARD B. HOLT

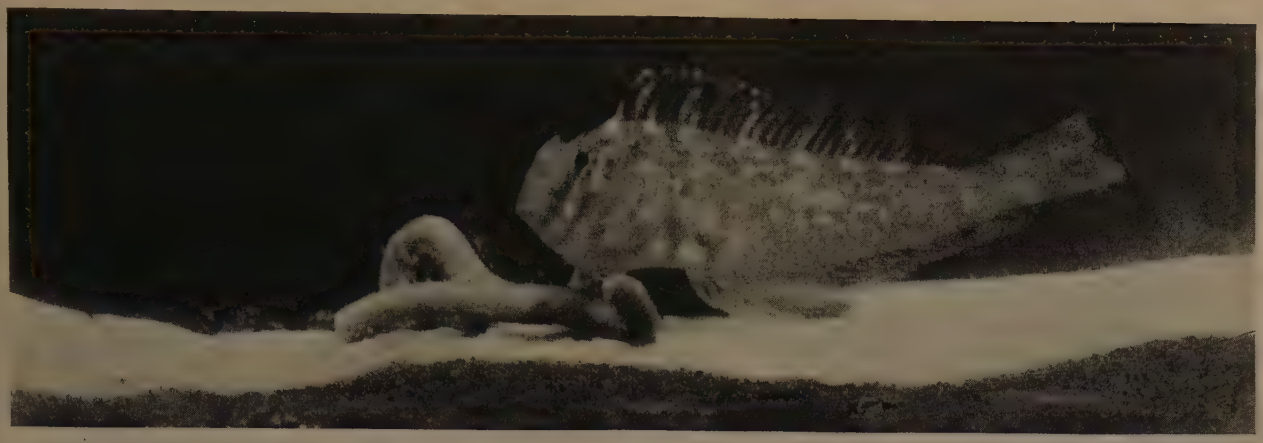
PHOTOGRAPHS BY THE AUTHOR

ALONG the east coast and along the west coast of our continent, and along all the shores of all the seven seas, there lies a world. It is a narrow ribbon of a world, wide by a few hundreds of feet at most, but long by thousands upon thousands of miles. It is a world set apart from all others, and one of topsy-turvy, where flowers bloom upon animals, and where animals, rooted firmly, live out their lives in one small spot—a world of true tales too tall for a Marco Polo or a Baron Münchhausen. It is that world of the sea which lies between the tides.

A BOTTOM VIEW OF THE WORM APHRODITA

In some varieties this denizen of the sea is so gorgeous that it has been aptly compared to the hummingbird

When the tide is low, at least a part of this incredible realm lies bare, and, if the beach be rocky and a town near-by, always people may be seen idly or earnestly exploring it. So great is its fascination and so varied its forms that it draws, not a few, but many. But, practically without exception, the searchers merely pick up such of its inhabitants as are found, and then futilely toss them back, with scarcely a glimpse of their greatest charms, which are their ways of liv-



THIS PHOTOGRAPH MIGHT BE ENTITLED "THE DIET OF WORMS"

A tide pool fish looks up from his protesting meal. But worms of the seashore should not be ignored for the aquarium—because many of them possess rare beauty

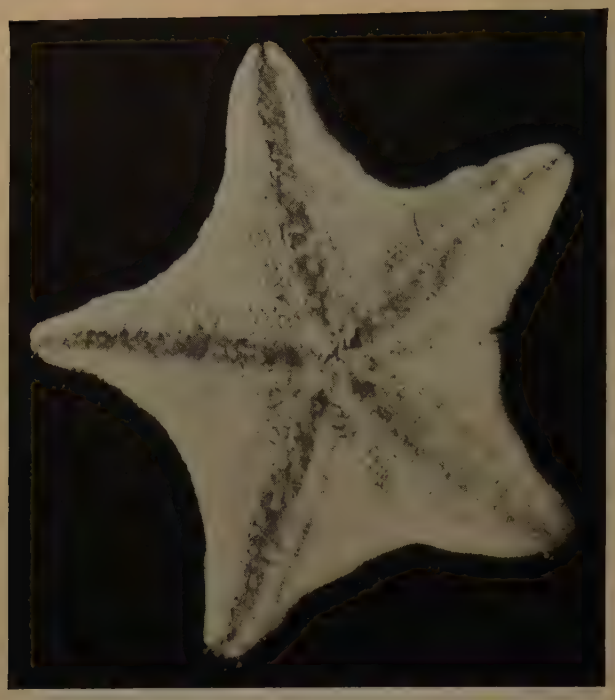
ing. Yet practically without bother or expense, these little people may be taken home and there they may be watched leading their bewildering lives in their own natural way.

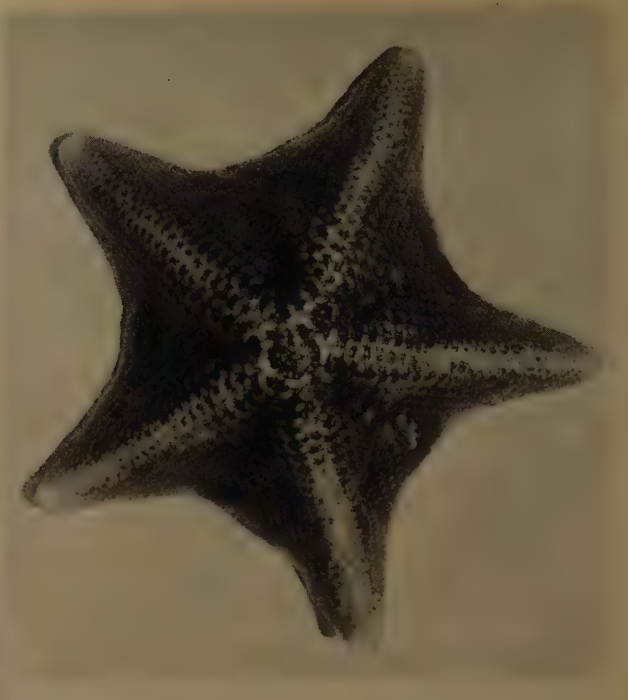
To those who care more for the creatures than for the container, complex aquaria are unnecessary, but certain requirements must be kept in mind. Strangely, air presents a problem of primary importance. In a deep, narrow pool, unless air is forced into the water by some means, the inhabitants will soon use up that which it contains, and suffocate. However, if the pool is shallow and wide, the larger water surface exposed will absorb air sufficiently rapidly. Our container, then, must be so shaped as to give us a fairly large but rather shallow pool—in other words, a dishpan. As simple as that! It must be graniteware, for bare metal will speedily poison the water. A light pan fifteen inches wide at the top and four and a half deep is marketed for thirty-five cents, and serves admirably. If a rectangular glass aquarium is used, it should be only partly filled with water, the galvanized bottom *must* be thickly coated with asphalt paint, and three sides should be covered with black cardboard to keep out excess light. Fish globes are hardly suitable. This solution of our first problem is as satisfyingly effective as it is simple.

Having selected our vessel, we may prepare it for its finny populace. First, the bottom should be covered with an inch or so of good, clean, beach sand. Well-washed river sand is sometimes recommended, as it doesn't fly about when water is introduced, but the author prefers the naturalness of the finer beach sand, and, too, little crabs scurrying about track it up delightfully. The water may now be poured in. It should be pure, fresh sea water, and may conveniently be siphoned in through a short length of rubber tubing. On future fillings, the discharge from the tube may be directed upon a rock to avoid stirring up the sand. The pan should not be filled too full, as shrimps, which have a way of dashing madly about now and then, might flop clear over the rim and land on the floor, and crabs, perhaps, would scramble out. For the size of pan mentioned above, a gallon of water is about right. Next, two or three small beach stones should be placed in strategic positions. The stones should be selected carefully, as the growth upon them helps to feed the pan's inhabitants. Those covered with a good supply of the common Ulva, or sea lettuce, are best, and all green weeds seem safe. But the attractive red and brown ones should, alas, be introduced only in minute quantities, for they almost invariably will poison the water. However, a partial exception must be noted in the case of the luscious, thick stems of the common brown kelp, several short lengths of which should be kept in each pan, as this appetizing substance, *if taken from the debris at the bottom of a tide pool,* is relished as food by little crabs and shrimps, and small sea urchins will gobble it

THE SEA CUCUMBER FEEDING FROM THE SAND

This fellow is well named with his many humps and bumps, although his color is far more interesting than the garden cucumber which he really resembles





TWO VIEWS OF THE COMMON STARFISH, ASTERINA MINIATA

At the left we see this familiar fellow from below, the photograph having been taken through glass. At the right we view him from above

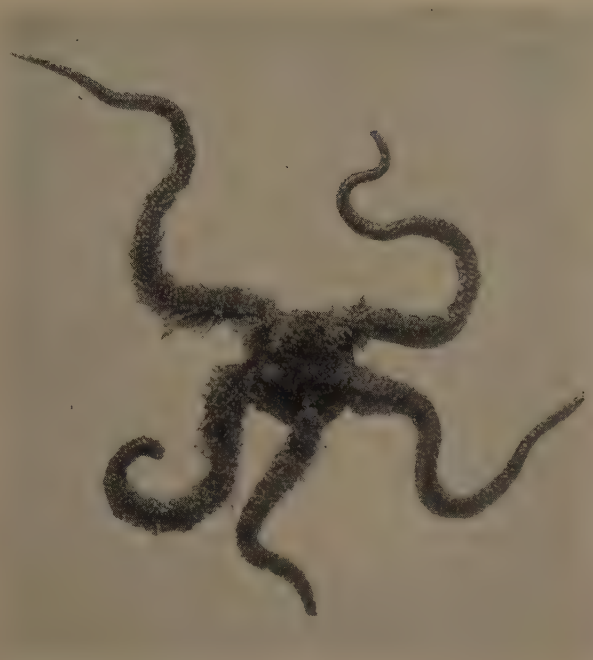
down in staggering quantities that seem impossible.

When the stones are in place, the height of the water should be marked on the side of the pan, and, as evaporation progresses, its level brought back to the mark by the addition of good soft fresh (*not* sea) water. Several pans may be used to advantage, as no one of them should be made to support too great a population. Besides, in this tidal realm, one creature's friend is another's dinner, and a discreet segregation is in order. Finally, a subdued lighting is necessary, as ocean creatures love darkness, and the pans should be kept in a cool place—especially in summer—in order to maintain an acceptable water temperature. In fact, on summer days it may be found well to cover the pans, first, with a sheet of glass or metal, and over this, with a layer or two of damp burlap. In the writer's locality (southern California) sixty degrees is about as high a temperature as is safe for many little ocean folk, and in cooler sections an even lower temperature would doubtless be found advisable. During the cooler months the temperature problem disappears, and many persons will doubtless prefer to maintain their aquaria only during that time. Dead specimens should be removed promptly, and new, fresh sea water substituted for the old every two weeks, or somewhat oftener, if convenient. These things done, no more is necessary to the preparation and maintenance of your own little ocean world.

THE LOVELY JELLYFISH

This specimen was kept in good condition during two week's captivity and was finally taken back to the sea none the worse for its experience

We now come to the collecting, which is half the fun. Choose a time of low tide and a rocky beach, and remember that a mile away may be another rocky beach populated with quite different life. Wear old clothes and ancient shoes which will permit you to wade right in. Carry with you two pint or quart jars for specimens, a piece of gas pipe two and a half feet long with one end flattened and bent at right angles to form a pinch-bar, a small hand-net about four inches in diameter on a two



A LITTLE BRITTLE STAR

These citizens of the seashore are, however, exceedingly poor subjects for the home aquarium

THE CRAB ON GUARD

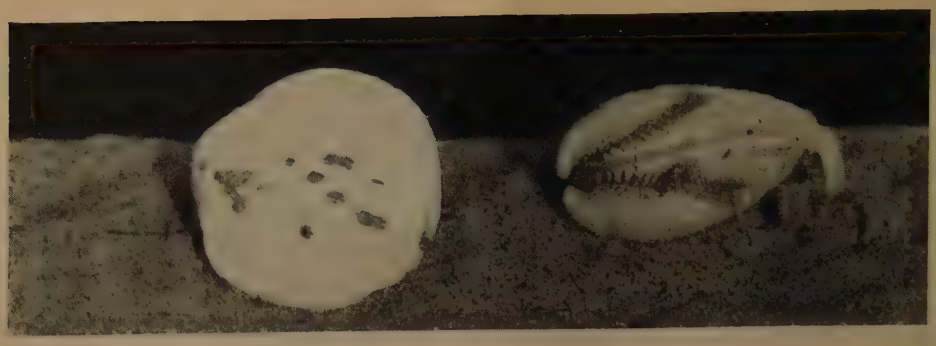
If too large specimens of crabs are put in the aquarium its contents are likely soon to be in the crab

ULVA OR SEA LETTUCE

This is decorative and edible and should be included in the aquarium to reproduce natural conditions

or three foot handle, and a stout pocket knife for prying up clinging shells. Choose a small section of beach and work it thoroughly. Peer under overhanging ledges, explore tide pools minutely, search among weeds, especially the great so-called "kelp roots" which wash ashore, and, with your gas pipe, turn over rocks. Most decidedly, *turn over rocks;* all sorts of startled little beings will be found beneath them. Explore every nook and cranny. Proficiency comes with practice; a technique in searching will soon be developed, and the accustomed eye will discover creatures which at first might pass unnoticed. Take only a few of any one variety, choose small specimens in the case of those which grow large, and turn down nothing because of its appearance. An ugly black worm is apt to surprise you with a delicate and beautiful blossom. The greater the care expended in collecting, the greater will be the rewards.

Naturally, in thinking of the life of the sea, fish come first to mind, and, to the diligent searcher, the tide pools will yield many small sorts which are suitable to the home aquarium. However, when we bring home a fish we must be prepared to go to just a little trouble in its behalf, for, as our little vertebrate is the highest type of life that we shall find, so, also, is it the most difficult to feed. If our pan is correctly stocked, most other creatures will pick up a living in it without thought from us, but Mr. Fish prefers, if you please, something that darts about or wriggles or squirms. Some of the big-mouthed and perpetually hungry varieties will be delighted with a small angleworm, and really fresh ant's eggs may also prove acceptable. But finely-chopped beefsteak or fish generally interests them not at all. However, if a wide-mouthed jar on the end of a cord is dropped to the ocean bottom just behind the breakers, as the tide recedes, it is often possible to catch tiny shrimps which are relished



TWO SMALL COCKLES, PAPHIA STAMINEA

These are photographed beneath the water. The one at the right is thrusting his foot into the sand in order to draw himself down. They add much to the interest of the home aquarium from the seashore

by a fish. Or, with a fine-meshed sieve, wee unlucky beasties may be strained from damp beach sand or tide pools. At worst, the difficulties of feeding are relatively small, and some of the beautiful and interesting sorts of fishes dress up an aquarium greatly. Besides, like all ocean creatures, a fish is apt to surprise you with some wholly unexpected talent. The author once brought home a little fellow who had a penchant for digging round holes straight down into the soft sand—a seemingly impossible feat. His procedure was most amusing. He had, of course, to wiggle out of the partly-dug hole backward with his mouthful of sand—which he carried off and blew out in a cloud—and then to dive back in for another, but every now and then he varied the routine by entering tail down, obviously to see how deep he had dug. And when the hole was finished, he could pop into it head-down and re-appear head-up, there to sit, hour after hour, with only his head protruding from his little doorway. Most certainly, let the finny tribes be represented in our pans!

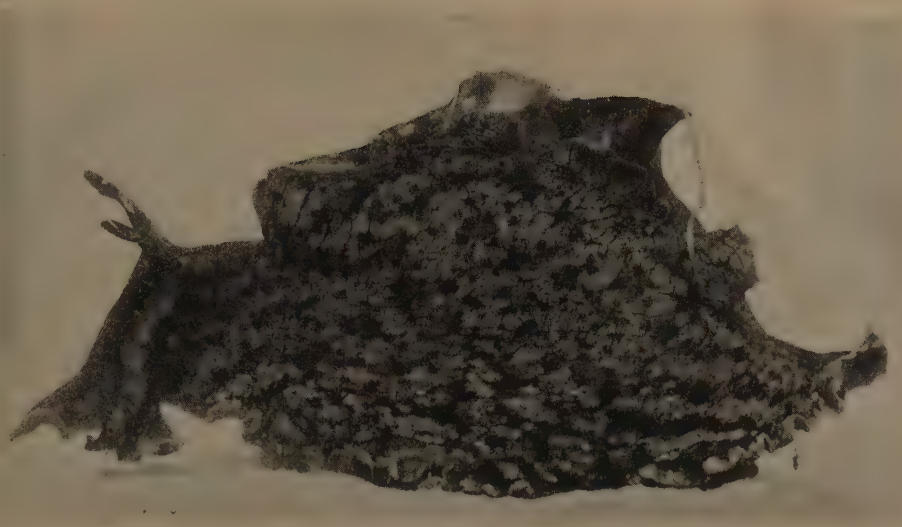
A SMALL SEA URCHIN

Called Strongylocentrotus purpuratus, and remarkable both for the size of his name and his appetite

While fish come first to the mind, the first living being actually to catch the eye on any rocky beach is apt to be a crustacean. In every pool, on every rock and in every nook and cranny, we find the lively little people who wear their bones outside—the beings represented in our tidal realm mainly by the crabs, the shrimps, and, surprisingly, the lowly and *un*lively barnacle. And, with the exception of the barnacle, practically all crustaceans will live well in the home aquarium. All sorts of delightful little crabs may be turned up. But beware!—these are a pugnacious little people, and should your crabs not be kept very wee, scenes of carnage will most certainly ensue. If, at evening, one large crab is in your collection, by morning your collection very likely will be in one large crab. Rather an unorthodox little fellow is the hermit—the clown of your water world. Whenever a shell whose snail-inhabitant should move with deliberation gets up and scampers off, that shell contains a hermit. For the hermit crab, one of whom may be found in absolutely every shell not otherwise tenanted, is obliged by his partly naked condition to seek shelter for his caudal softness in the empty or emptied abode of some snail. Crabless empty shells being almost non-existent, constant battle to keep title to his home is the hermit's lot, the aggressor sometimes audibly rapping the shell of his intended victim against a rock or against his own shell in an often successful effort to drive him out. And few things in the sea are more comical, or, to us, more understandable, than the indecision of a hermit, who, finding himself possessed of two good shells, slips back and forth betwixt them, unable to fix his desire upon either. Aside from

A TIMID BUT HARDY LITTLE SHRIMP

Shrimps are excellent and often beautiful additions to the home aquarium. They are splendid scavengers and for that reason alone, if for none other, they should be included



A TWO-POUND SEA HARE WAS FOUND ON THE BEACH

This one measured nine inches from stem to stern, but fifteen-inch specimens are not unknown. It is called, in fishy scientific circles, Tethys californica

SHELLS OF THE DAINTY PECTEN, A FAVORITE

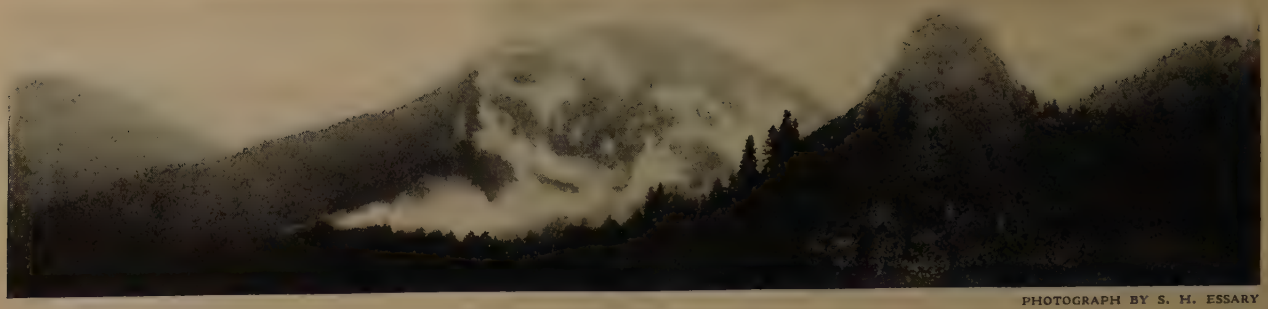
These will frequently delight the aquarium owner by swimming through the water with rapidly flapping shells from which a row of eyes peer forth, if you will look closely at them

crabs, the commonest variety of crustacean suited to our needs will generally be found to be the shrimp, which occurs in a number of often widely differing varieties. Some of the less secretive sorts are so beautifully marked and colored, and sail about so gracefully, that they soon win a place in any heart. All these small crustaceans are excellent scavengers, and for that reason alone, even if there were none other, a few of them should be included in every pan.

Even more plentiful than the omnipresent crustacean are the members of the great Phylum of the Mollusca. Though generally of rather sedentary habits, and so a little less apt to force themselves upon one's attention than the scurrying crab, almost every square foot of every rocky beach, and sometimes of sandy ones also, will be found to support its population of molluscs. The mollusks include all the snails and slugs, all the bivalves—clams, oysters, mussels, etc., —and all such bizarre beings as the octopus and the squid. Small octopuses may sometimes be found under stones or in crevices, and when one turns up, take him to a large pool and watch him shoot through the water like a little rocket. But leave him in his watery home, for these odd little creatures require that a great deal of oxygen be dissolved in their water, and will not live in your simple pan. Besides, unless his container be tightly covered with a weighted lid, you probably will be startled during the evening to find your little octopus sitting all in a bunch in the middle of the floor. Much better suited to your needs are the various snails living often in exquisite shells. Clinging fast to rocky surfaces, fully exposed to the rushing waters, will be found the tent-like and home-loving little limpets. Each of these, with every recurring low tide, will return from his rovings to the self-same spot upon his stony world, in time wearing a tiny hollow from the solid rock beneath him. Beside him will be found the odd, flat and lengthy chiton, or cradle shell, whose jointed armor permits him, in his perambulations, to fit his form snugly around the most abrupt of rocky corners.

The myriads of spiral shells, among which so much of beauty is harbored, generally seek less exposed locations. A few of all such beings, especially the limpets, should be permitted to crawl upon glass, that their large creamy foot and dainty head may be seen to advantage. These queer little folk all must be shepherded a bit, for they have a habit of adventuring above the water level in your pan and there awaiting patiently the rising tide—a practice disastrous to their well-being. Shells are not a universal possession among the mollusca, and some of the small naked molluscs, with their delicacy of form and color and gardenlike rows of gill fringes, rival the beauty of a flower. Many of these, however, require a good deal of air, and must be kept only in the airiest of your receptacles. Should they become logy, or even completely inert, lack of oxygen is generally the cause, and more must be supplied. This may be done by shaking some of their water energetically in a partly-filled and well-sealed jar, and then pouring it back, foaming, into the pan.

The sea hare, a large slug with rabbit-like "ears", is generally too big for our little pans, and besides, he is apt to eject a "smoke screen" of purple fluid—a most undesirable procedure in cramped quarters. Of the bivalves, those most obviously present are usually the mussels, which often transform (Continued on page 90)



PHOTOGRAPH BY S. H. ESSARY

OUR SMOKY MOUNTAIN PARK

NEWEST NATIONAL PLAYGROUND HAS WIDE NATURAL VARIETY

BY CARLOS C. CAMPBELL

VARIETY! With that you have a one-word description of the Great Smoky Mountains National Park. No other word so nearly typifies this high mass of rugged mountains which forms the boundary line between Tennessee and North Carolina. Nature lovers and scientists who visit the area nearly always express surprise at the extent and variety of its flora and fauna.

"This is the best display of the 'north woods' I have seen in twenty-five years. And, just think of it, I had to come to the heart of the South to see it." Such was the amazement expressed by Benton MacKaye, naturalist and regional planner, last Autumn on his first visit to the Great Smokies. Mr. MacKaye had heard of the great variety of trees and flowering shrubs, but had not expected to find here the nation's largest and finest remaining virgin forest of red spruce and balsam which are native to New England and southern Canada.

Nor does the element of variety stop with the flora and fauna. The two ends of the park area are as unalike as if they were separated by a thousand miles. The 427,000 acres comprising this newly established National Park is in an oblong, or oval shape, running nearly east and west for a distance of eighty miles along the zigzag course of the state line and having a maximum width of nineteen miles. The eastern portion, usually referred to as the wilderness area, is extremely rugged. Many of the peaks and knife-like ridges reach elevations of from 6000 to 6642 feet. The highest summits are covered with dense stands of virgin spruce and balsam and other plants of the Canadian floral zone. The western half of the park consists of gentle slopes and relatively lower peaks and ridges, ranging from 5000 to 5500 feet elevation, and covered

PHOTOGRAPH UNIV. OF TENNESSEE

ONE OF THE INTERESTING SMOKY MOUNTAIN FLOWERS

Great beds of dainty trout lilies are found in the foothills and at some of the higher elevations

PHOTOGRAPH © BY THOMPSON'S, INC.

ONE OF THE "BALDS" CHARACTERISTIC OF THE SOUTHWESTERN END OF THE PARK

There appears to be no generally accepted explanation of these grassy areas which are not above timberline but which do not support timber. Some think past grazing caused this

with open hardwood forests, which are typical of the Southern Appalachian Mountains. Many of the peaks are treeless and covered with grass. The cause of these "balds" is a mystery yet to be solved by ecologists. One thing, however, is certain: they are not above a timberline. These "balds" are from 100 to 300 yards in width, resting astride the state-line crest. Their length varies from a few hundred yards to two miles.

The National Park Service bulletin on the Great Smoky Mountains National Park states that these mountains "include the largest and finest virgin hardwood forest in the United States, also the largest virgin forest of red spruce;" a rather remarkable combination of distinctive features for the nation's sixth largest National Park. The hardwoods are found throughout the western portion and on the lower slopes of the eastern half of the park.

A clean forest floor, resembling a well-kept country estate, is found in most parts of the western half of the park. Tangled growths of rhododendron and mountain laurel prevail throughout the eastern portion. These are found alike under the forest trees and on exposed, treeless ridges, where they are known as "slicks." The accuracy of that description depends wholly upon distance from them. As seen from the foot of the mountain, or from another ridge, they do appear as smooth, or "slick," surfaces. But "roughs" would be a more appropriate name if one is to penetrate, or try to penetrate, them. These shrubs often attain a surprisingly large size. A mountain laurel, *Kalmia latifolia,* measuring thirty-two inches in circumference at three feet above the ground was found on the side of Woolly Tops, in the wilderness area of the park. Cherry trees four or five feet in diameter are not uncommon. On the slopes of Mt. Guyot is a section known as "the cherry

PHOTOGRAPH UNIV. OF TENNESSEE

THERE IS A WIDE VARIETY OF WILD FLORA IN THE PARK

Millions of trilliums line the trails and grace the forest solitudes of the Great Smokies. Here is Trillium cernuum

PHOTOGRAPH A. G. ROTH

MT. LECONTE IN THE CENTER BACKGROUND
This photograph is taken from Mt. Champan and encompasses one of the principal wilderness areas in the Great Smoky Mountains National Park

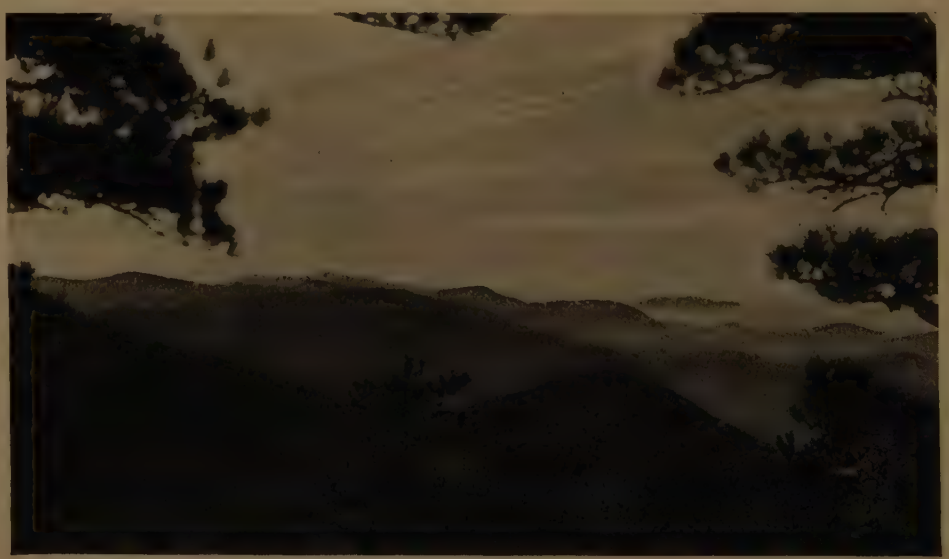
orchard" because of the large number of giant cherry trees found there.

Chief among the deciduous trees are many varieties of oaks and maples, magnolia, basswood, cherry, beech, birch, ash and chestnut. During the past ten years the blight has almost wiped out the chestnuts. There is now much speculation among foresters, botanists and bacteriologists relative to the possible immunity to blight among the new growth of chestnut that is coming back.

The floral display of the Great Smokies ranges from the delicate and exquisite orchids to 152 species of forest trees. There are twenty-two species of orchids and scores of lilies. Many kinds of violets are found, as are trilliums and other herbaceous flowers. Not merely is there a great variety in species; there is also a surprisingly great range in blooming season. To illustrate: rhododendron often blooms in the foothills as early as the middle of May, whereas it is not uncommon to see them in bloom on the higher summits as late as August. The middle of June is the time when most of the rhododendrons are in bloom, however. The flame azalea, *Rhododendron calendulaceum,* in color tones running from almost white through the various shades of lemon and orange to almost red, has an equally long blooming season. This is, of course, due to the great altitudinal variation in the Smokies. Elevations of from 1300 to 6642 feet are found.

Animals of the region have not fared so well as have the plants. Short-sighted and over-intensive hunting practices are largely responsible. Destructive lumbering methods used throughout the region around the park and in a few sections of the park itself (before it became a National Park) have also levied a heavy wild-life toll. The irony of it is that the prevailing method used by the larger lumber companies is called "modern." Most of the trees too small to cut are broken down by the "skidders" in taking out those that are cut. But, worst of all, is that fire usually sweeps through the slashings left by the lumbermen—destroying or driving out many forms of wild life. Fortunately

PAINTED TRILLIUM
Trillium undulatum is one of the eight species found in the area



A SEA OF MOUNTAINS FROM ROCKY SPUR TRAIL
From this point is seen Bullhead, the Sugarland Mountains, Miry Ridge and Thunderhead in the distant background

PHOTOGRAPH A. G. ROTH

PHOTOGRAPH © BY THOMPSON'S, INC.

THERE ARE MANY SUCH BROKEN OPEN VISTAS IN THE VIRGIN HARDWOOD FORESTS

Such spots as this are found throughout the southwestern half of the Great Smokies and in the lower elevations of the other half. Here is the west end of Mt. LeConte

for Nature lovers and for the Nation, most of the 427,000 acres in the park were still in virgin forest when the National Park was established. A considerable portion of that which had been lumbered had not been burned and, with the Park Service protection, will in a few years' time again resemble its original beauty.

The chief consideration of the National Park Service in laying out the five million dollar development program which is now under way is that of protecting and displaying the natural beauty of the mountains. Under the watchcare of the park, fires are not likely to occur, and if one is started it will be short-lived. The presence of look-out towers at strategic points and the carefully located trails and roads make this possible.

Nature lovers will be interested to know that large sections of the park are being preserved as wilderness areas—with only such trails as are essential for fire protection. Trails and motorways are located, and built, with great care, the purpose (aside from fire protection) being to make more easily accessible the wilderness solitudes, and to leave the least possible visible evidence of the intrusion. The general location of a trail is based upon the need for fire protection. The exact location may be swung hundreds of yards—or even a mile—to one side or another to give a better panorama; a more interesting bit of forest; views of waterfalls and cascades; a particularly interesting mass of wild flowers; or to miss the nest of northern raven or duck hawk. Flowering shrubs taken from motorway or trail grades are planted in a temporary nursery until the construction work is completed. They are then re-planted on the banks of the new road or trail. Seeds are gathered and sown on these same banks. Within a few years there will be no visible scar. Natural ecological association is followed closely in this landscaping. No exotics are used—and, to the National Park Service, a tree, shrub or wildflower growing at a few thousand feet too high or too low elevation is just as much an exotic as if it came from a foreign country.

Superintendent J. Ross Eakin and his able corps of associates are seeking so to develop the Great Smokies that there will be large areas to suit the fancies of the many types of park visitors. These areas range from almost impenetrable wildernesses to modern motorways, with crude trails, modern trails and bridle paths in between.

Formal opening of the Great Smoky Mountains National Park will likely be in the early summer of 1935. Even in advance of such ceremony, the attendance is increasing at a rapid rate. In fact, the number of visitors in the Great Smokies last year exceeded that for any other National Park. An all-year open season, a great variety of natural attractions and proximity to great centers of population all contributed to the winning of the attendance honors by this, the newest park in the entire system.

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THE CHANGE IN COVER

The change in cover with this issue of Nature Magazine is a reflection of expressed desire on the part of many of our readers for a sturdy, simple cover that will stand the wear to which Nature Magazine is so often subjected. Others have voiced the opinion that the color covers, while attractive, are marred as pictures because of the lettering which is necessarily a part of them. They have expressed a desire for other features within the magazine in place of these interesting but transitory color covers. These features we will endeavor to supply, beginning with the October issue. So, with a return to an adaptation of the cover which served us so well during the first four years of the magazine, we invite your frank and considered opinion.

EXPLORING NEW HIKES

BY ERNEST A. DENCH

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This is the third of three articles by Mr. Dench on some phases of organized hiking. They have been presented in reflection of the tremendous growth of this activity and to discover whether our readers believe that a special hiking department should be included in Nature Magazine. The response of our readers will determine our future editorial course in this regard.

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ALONG THE APPALACHIAN TRAIL
This is Little Dam Pond which the Maine to Georgia Trail skirts near Southfields, New York

AFTER the first two exploration trips, a projected new hike may seem hopeless. You decide to tackle something else. During the week your subconscious mind is at work. What was unsolvable last Sunday night seems clarified now. You return refreshed next Sunday. Your enthusiasm rises. You still meet with difficulties, but with the goal in sight, you keep plugging. You forget such practical things as trains, and find yourself at dusk miles away from a station on some unfrequented dirt road. You don't care. The stars are out. The air is deliciously sweet. An occasional rabbit dashes across the road. A deer glides into the forest. A surprised ruffed grouse makes a loud commotion. Such are the fascinations of exploring new hikes to lead your friends over later.

Because it was difficult to have your friends agree on a date, it may be late fall or early winter before the new hike is staged. Your friends admire your leadership, yet you secretly lack confidence in yourself. A scenic transformation has occurred. Most of the familiar summer landmarks are missing. The woods, once covered with lush growth, are naked. This going over a hike in two distinct seasons is a common experience with club leaders and guides. Carefree summer days are utilized to survey new trips, which cannot be scheduled until the next program is prepared—and this may cause a delay of several months or even longer.

Trail intelligence comes to the rescue. The mistake usually made by the inexperienced leader is to rely too much on temporary landmarks, and pay insufficient attention to permanent means of identification. There are several landmarks apt to disappear or alter in other seasons.

IN THE "LEMON SQUEEZER"
Mr. Dench making his way through a unique rock crevice in the Ramapos

Foliage of the hardwoods is one transitory mark. Perhaps you recall one entrance to a minor trail is enclosed with a bower of maple leaves. While the maple tree will still be there, the released weight of the leaves may cause the branches to swing to one side, leaving a conspicuous opening to the trail.

Clumps of wild flowers you once noted may have flowered and died. The withered leaves and stalks are liable to be obscured by the high grass rising in their midst.

You wonder what became of the marsh or swamp and whether it is false or genuine. The spring thaw or heavy rains may transform a piece of

THE GARGOYLE
One of several natural "monsters" found on an alluring hike in the East

dry but low-lying ground into a marsh for a few weeks. The vegetation exposes the faker. The section of the country will determine bona fide marsh or swamp vegetation. In the northern part of the United States, look for islands of hummock grass, catbriers, cattails, alders, swamp maples, high-bush huckleberries and flowers with a preference for juicy ground. Any reliable botanical work of reference may be consulted for the full list and details of their individual characteristics. Not all the species enumerated will be found in the one location, but some of them surely will.

A brook overflow can prove very deceptive. During the spring thaw or after heavy rains, water will gush down wide trails and leave them in a washed-out condition. These young upstarts perish at the first spell of dry, warm weather, when you can take a reliable inventory of the permanent brooks.

There are, however, permanent landmarks which can be relied upon. These may be: a rail fence or stone wall as a property boundary line; the cellar hole of an abandoned farm; a giant dead but upright tree such as a chestnut (even if a storm has felled it in the interim, you are bound to notice it); a rocky ledge in a gorge or equally conspicuous location; painted blazes on trees to denote divisions in land ownership; a house or a building down in the valley painted a vivid color or architecturally distinctive. You should carefully note all these guides.

There are also artificial aids to your memory, in case you are not yet confident of your ability to find the route at later dates. On other than clear trails and back roads, bend twigs within arm's reach on trees and shrubs at visible distances apart. At junctions increase the number of twig markers. This rudimentary form of trail blazing is to be recommended on your first or second scouting trip, particularly if you plan to return the same way. Any subsequent changes in the course can be amended by breaking off the tell-tale markers. When the route is perfected, white strips, about pencil length and width, torn from old shirts and sheets, can be tied to the trees for easy guidance. We do not advise blazing trees on private property with an axe. The owner has a perfect right to object, and may permanently close his tract to hikers. Another thing, unless the blazes are expertly done, the trees will be permanently damaged.

A minor wilderness area within thirty to fifty miles of one of our largest cities exemplifies the "herd" habits of organized hiking groups. A few trails receive the heaviest traffic; some are not visited so often, while others are practically neglected. We should say, offhand, that more hikers visit this attractive terrain than any one other elsewhere in this country. They have made it a mecca for years. The outsider will naturally assume the possible supply

HIKER'S MECCA
Terrace Pond, popular spot with many. One hiker climbs for a better view

of virgin hikes is exhausted. Far from it, in fact. The enterprise of the scouting minority continues to be rewarded.

One favored objective of one hiking club is the county's highest mountain, 1690 feet high. You look down in a certain direction, from this superior height, on what resembles gently rolling uplands. Two bold pedestrian explorers decided that these nearby hills were worth investigating; they might contain the makings of a full day's hike. Greatly to their joy, they ferreted out sufficient material for two separate hikes of about nine miles each.

Highway and real estate developments were blessings in disguise to a recently re-routed link of the Appalachian Trail. The pioneer developers of the route used a dirt road for several miles instead of keeping to the primeval hills, of which there was an abundance. What wrought the desired but belated change, at a point further down where the A-T regained its beloved wilderness, was a summer resort development. About two miles of low-lying woodlands were flooded to make an artificial lake, and adjacent acreage hacked for bungalow plots and roads. When the group responsible for the trail's maintenance here had recovered from the devastating blow, alternate routes were surveyed in the rough. Due to this civilized interference, the re-routed Appalachian Trail at this sector now passes several stands of giant hemlocks and southern white cedars of original growth. And the old road, just beyond here, is deliberately dodged in favor of a mountain climb, culminating in a magnificent view.

Any club officer soon learns that the majority of members prefer to be led rather than lead. It is equally true of a small circle of hiking companions, when there's a born leader in their midst. Perhaps it is for the best, as it avoids the situation of all officers and no privates.

We know one experienced hiker—and there are others like him—who has participated in more than one hundred different club hikes. Some of the trips he has taken innumerable times. Here is a man one would reasonably expect to hold a vast storehouse of trail knowledge, and could easily substitute for the regular leader in an emergency. Intelligent as this man is, he has never studied the trails, has little conception of distances or directions. He is content to follow the leader, except on one wild tract, which he knows more intimately than any fellow club member. His fascinating hikes there reveal initiative which he seems to suppress when trailing behind other leaders elsewhere—the true soldier spirit.

There is no question that the hike leader in his own right finds his mental faculties dulled while participating in another leader's trip. He readily falls into the easy-going, unobservant stride of his companions.

Here's to some days of true contentment. To us, the scouting trip is the most exalted form of hiking. We always look forward to the day when the club "curtain" goes up on a new hike, with many friends to appreciate it.

KILLDEER CAMOUFLAGE

BY HAMILTON M. LAING

MANY of us have wondered on observing the clever way in which wild creatures hide themselves, just how much they understand of the art of camouflage which they use so well. The grouse squatting on the woods leafage, the nighthawk on the bare ground, the snipe or bittern in the marsh grass—how well they escape the keenest eye—even when that eye is looking hard for them. There is no doubt at all that many birds secrete themselves in the sort of cover that hides them best, but it is difficult to say how much they know about their art—how much is design and wit rather than a mere fitting by Nature through endless generations into a scheme whereby they are camouflaged automatically.

Of our common birds about the open country the killdeer is quite a brightly marked bird, yet one of the cleverest in picking a hiding place when wishing to lose itself in the landscape; this desire is most manifest at nesting time. It is then that we see the best use of the bird's wit, the keenest instincts, the nearest approach to reason. This of course is because nesting is a game of wits; it is a most precarious time when ardent hopes are blasted or new creatures succeed in reaching maturity, mainly according to the craft of the parents.

A killdeer one spring was observed to pick for a nest site the exact spot in a very bare wheatfield where a bucketful of broken plaster had been thrown! Now a killdeer's coat is a bold mixing of gray, black, white and chestnut. Could it be said that this choice was an accident?

In the illustration shown herewith the mother killdeer picked a site on a plot of gray sand with a few scanty green or gray weedtufts and among a sprinkling of small cobblestones mostly lighter in color than the sand. She laid her eggs in a hollow between two speckled stones, one pinkish, the other whitish, and her ruse was so successful that though crows passed over her almost hourly, she raised and took off her brood unmolested. Who can say how many sites she tried before making the decision, or deny that in that final choice there was a little of something higher than the "blind" instinct vouchsafed them by many students of bird behavior?

IRIS PROGRESS

BY HOWARD EVARTS WEED

THE PROGRESS in iris hybridization has been greater in the last decade than the advance made in any other flower. Because seedlings bloom the second year after the seed is formed and planted, the time elapsing between generations is short. By taking seed formed from crossing two of the best varieties in existence one season, the hybridizer can produce entirely new, and, in a few instances, better flowering plants two years later, at which time the cross may be made between these new offspring.

Because of the comparative ease in making such cross-pollenization, the great adaptability and easy culture, and the short time elapsing before the seedlings bloom, the field of iris development has attracted amateur "Burbanks" in increasing numbers. It is largely due to these amateur hybridizers that the iris flower has advanced so rapidly from comparative obscurity into a position of popularity challenging that of the rose for first place among the hearts of flower lovers. Because amateur and professional hybridizers have expended so much effort in making this world a more beautiful place in which to live, we now have iris flowers which are twice as large as any which existed in 1920; which are nearly twice as tall as the average stalk then in existence; stalks which bear three times as many blossoms; and blossoms of such varied hues and new color blendings as to have been beyond the wildest dream of those early workers.

THE AUTHOR MAKING HYBRIDIZATION CROSSES

The development in varieties. size of plant and bloom in irises has been remarkable during the past ten years

It is interesting to compare the catalog of a well-known iris firm issued in the year 1920 and their present edition. Their early pamphlet listed a hundred of the outstanding varieties of that day which was practically the entire number of varieties then in commerce; this year's edition lists some four hundred varieties and these are the cream of the many thousand varieties introduced upon the market since 1920.

The reader searches in vain in this modern catalog for such old familiar names as Archeveque, Barton Harrington, Dejazet, Dr. Bernice, E. L. Crandall, Eldorado, Flavescens, Her Majesty, Honorabilis, Lohengrin, Mme. Chereau, Mrs. Neubronner, Nibelungen, Princess Louise, Queen of May, Quaker Lady, Sherwin-Wright and any number of others which were so much in demand in that early era. A bare quarter dozen have survived to be listed this season. Where are the others? They are growing in the gardens of backward gardeners who either do not know or care that their flowers are inferior to those which they might now obtain.

The once familiar names have been replaced in the minds of iris lovers by such names as Bruno, Cardinal, Coronation, Dolly Madison, Frieda Mohr, Purissima, San Francisco, King Midas, Sir Michael, Dauntless, and Pluie d'Or.

In comparing the descriptions contained in the two catalogs, we find that the average height of the early originations was around 25 to 35 inches, while the present day introductions range from 40 to 50 with occasional stalks reaching 55 inches and higher. The average size of the flower just after the war was three to four inches in length while the present flower ranges from five to seven with such giant blooms as that produced by the variety Nene and a few others stretching more than nine. The average number of blossoms on the early bloom stalk was three to four; the average at the present time is seven to ten with a few varieties invariably producing 12 to 15. I once saw a stalk with 32 individual buds, but this, of course, was an exception.

Most of the colors we have (Continued on page 91)

PHOTOGRAPH BY W. C. MATTHEWS

VARIOUS VIEWS OF THE "WHISPERING FUNGUS", INSIDE AND OUT

These plants consist of two parts, the black caps and the white, fluted, orificed stems. The caps occasionally are of a tan color and are more or less convoluted and brain-like. The stems often become discolored from a coloring matter in the caps. Note the irregular canals in the stems cut lengthwise, or crosswise. The spores are white, and you can see a powdery white layer of spores on some of the caps. The tissues look brittle but are, in reality, quite tough.

THE WHISPERING FUNGUS

BY ELIZABETH E. MORSE

A LARGE number of these black-capped mushrooms, *Elvela mitra,* were collected by Don Brunton, University of California student, on a steep hillside planted with pines and overlooking the far-famed stadium and the Golden Gate beyond. While he was bending over these plants, digging them from a deep mat of pine needles, he noticed a peculiar sound which he attributed to the presence of insects in the duff. However, he lifted a plant to his ear and heard what sounded like steam escaping from a tiny aperture. To one this suggested the effervescence of pop and to another the soughing of a breeze through the leaves.

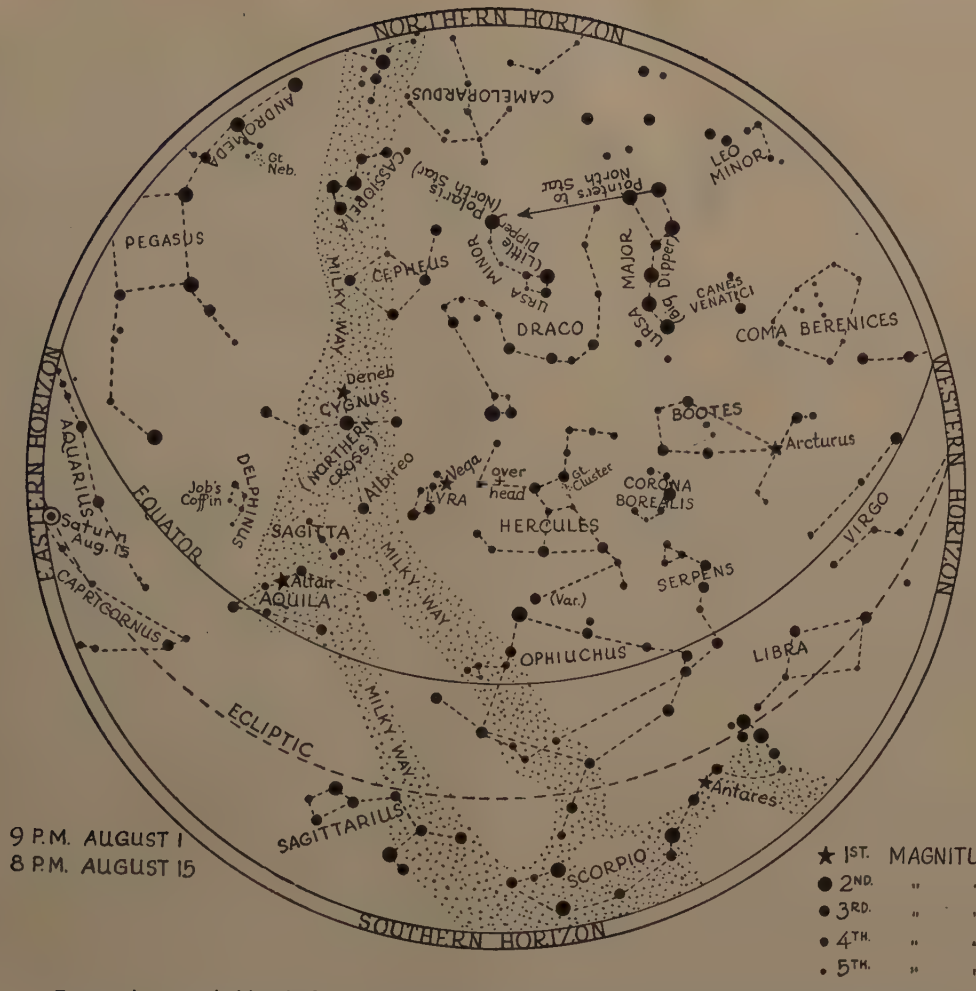
We have here a group of plants in which the spores as revealed by the microscope are arranged in long sacs—eight to a sac—each provided with a tiny lid at the top. When air currents are created over fully-ripe specimens, the lids fly up and the spores rush out in such numbers that they cause an appreciable sound. Hence, the "whispering" fungus!

The stem, waxy white at first, is always beautifully fluted and there are long slits or rounded openings at intervals. There are never two stems exactly alike.

Most of the caps are black, although occasionally one is found with a tan color. The caps are variously attached to the upper part of the stem, although sometimes they are almost "free."

We experimented with the whispering fungus. When we closed specimens in a box and suddenly removed the cover, they would whisper from time to time, but the vibration grew fainter and fainter and finally died.

There are other species in this group of plants which whisper, but we have rarely caught them in the act.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

SOME FACTS ABOUT THE MOON

BY ISABEL M. LEWIS

THE MOON is our nearest neighbor in the heavens and the only body that revolves around the earth. It is, with the exception of the sun, the celestial body that is most frequently observed and talked about, but it is remarkable how little otherwise well-informed people know about some of the most fundamental facts concerning it.

Where and when the moon rises puzzles many people. The phases and quarters are another source of trouble. Why do we speak of the half-moon at the first quarter, we are asked? What is the effect of the moon on people, the weather and crops? Does the moon raise the tides on the surface of the earth? Why should the horns of the crescent moon be turned away from the horizon? Why is a star never seen within the crescent in spite of the fact that artists and poets have made the blunder of thus representing them?

The cause of the phases of the moon we have all seen pictured with neat diagrams in text-books of Astronomy, but to visualize the three bodies concerned in the heavens in correct relative positions is not such an easy matter. Probably the easiest way to understand the motion of the moon through the heavens in the period of one revolution around the earth is actually to observe the moon from day to day in its course through the heavens. New moon will occur when the moon has its dark or night side toward the earth, but we will not ordinarily see the moon at that time because it is then either directly north or south of the sun and invisible except on those occasions when it comes directly in line with sun and earth and between them, hiding the sun temporarily and causing an eclipse of the sun. In that case we see it as a huge, black globe passing between us and the sun. The next evening we will see a thin crescent moon in the evening twilight. The moon has now advanced in its orbit around the earth far enough for us to see a small portion of the side illuminated by the sun's rays appearing at the angle at which we see it in the form of a crescent. The horns, or cusps, of the crescent are the extremities of the illuminated portion farthest from the sun. The center of the

convex edge of the crescent is, of course, turned toward the sun, and if a line is drawn connecting the cusps or horns of the crescent, and another line drawn through the center of this line and at right angles to it, it will point directly to the sun, which is now below the horizon. It is evident that the horns of the crescent must, therefore, be turned away from the horizon and also away from the sun. We speak of the new moon at this phase as being low in the west, although the moon was, in fact, new a day or so earlier when directly between earth and sun. It is at this phase of the thin crescent moon that we have the phenomenon of "the old moon in the new moon's arms" as earthshine illuminates the dark portion of the moon's surface and the entire lunar disk is visible. The crescent is the part lighted directly by the sun's rays. The remainder of the visible surface is the night side of the moon illuminated by the rays of the sun reflected to it from the brightly illuminated day side of the earth, which, viewed from the moon, is now nearly in the phase of full earth. As seen from the moon the earth, of course, exhibits all of the phases that the moon does to us, only in reverse order. Most of the night side of the moon is now bathed in a flood of earthshine, which we can see even from the earth, just as at full moon the dark side of the earth is flooded with moonlight. Because the moon is an opaque body, the only way a star could be seen within the crescent would be for it to come between the earth and moon and be seen projected against the dark lunar surface. Of course, the stars are far beyond the outer limits of the solar system, and to picture a star between us and the moon is quite as absurd as to picture a transparent moon through which a star could be seen.

There seems to be a generally mistaken idea among many people that at this time the moon rises in the west because it is first seen there in the evening twilight. The moon, however, always rises in the east each day in the same manner as the sun and stars, and sets each day in the west. At this phase it rises in the east shortly after the sun but is first observed after the sun disappears in the west and it sets soon after it. The moon remains in the crescent phase about a week. Each succeeding day the moon rises later than the sun by an increasing interval of time, appears higher in the western sky at sunset, and sets later. The crescent increases in size as more and more of the day side of the moon comes into view from the earth. When one-quarter of the moon's revolution around the earth has been completed we see the moon exhibiting the phase of a half-moon, so called because at this time half of the visible surface is illuminated by the sun and half is unilluminated. It is now at the first quarter. At this phase the moon rises in the east at noon and sets at midnight, and is due south at sunset. From now on until the moon is full it is in the gibbous phase. More and more of the day side of the moon comes into view and a correspondingly smaller part of the night side. The moon now rises in the east in the afternoon and sets after midnight. At the time of full moon the moon has completed half of its period of revolution around the earth. It now rises in the east at sunset and sets in the west at sunrise and is visible all night. At this time lunar eclipses will occur when the moon passes directly through the shadow of the earth instead of north or south of it.

From this point on in its orbit the moon goes through its phases in reverse order. It is now west instead of east of the sun and rises in the east about an hour later each night.

When three-quarters of its revolution around the earth has been completed it is at the last quarter. It then rises in the east at midnight, is due south at sunrise and sets at noon. Again half of the day side is visible and half of the night side and the phase is again that of a half-moon. After this the moon is again in the crescent phase but it is now the waning instead of the waxing crescent, visible in the east before sunrise and drawing nearer the sun each succeeding day. About twenty-nine and a half days after the preceding new moon the moon is new again. Its dark side is again turned toward the earth and it is invisible in the rays of the sun. It will next be seen in the west in the evening twilight and a new revolution around the earth has begun. Always it keeps the same face turned toward the earth and completes one rotation on its axis in the time of one revolution.

Although, through its gravitational effect, the moon raises tides upon the earth, there is no foundation for the belief that it has any influence over weather or the crops, in spite of a widespread belief to that effect.

This is the month, it will be recalled, in which the annual swarm of meteors known as the Perseids are seen in great numbers. They should have their maximum display on August 11-12. As their name indicates, they will come from the general direction of the constellation of Perseus which appears in the northeast near midnight. They are yellowish in color and move with moderate speed. They should be seen to particular advantage this year as there will be no moonlight to dim their light.

Among the planets this month, Mercury will not be seen, except possibly the first few days of the month low in the east in the morning twilight. Venus is still a Morning Star and is quite high in the eastern sky at sunrise. On August 2 it will be in conjunction with Mars which is also in the eastern morning sky.

Jupiter is still a beautiful object in the evening sky in the constellation of Virgo, close to Spica on the northwest. It will be about twenty degrees above the southwestern horizon at sunset on August 15. Saturn is now in fine position for observation. On August 18 it will be in opposition to the sun and will rise at sunset and be visible all night.

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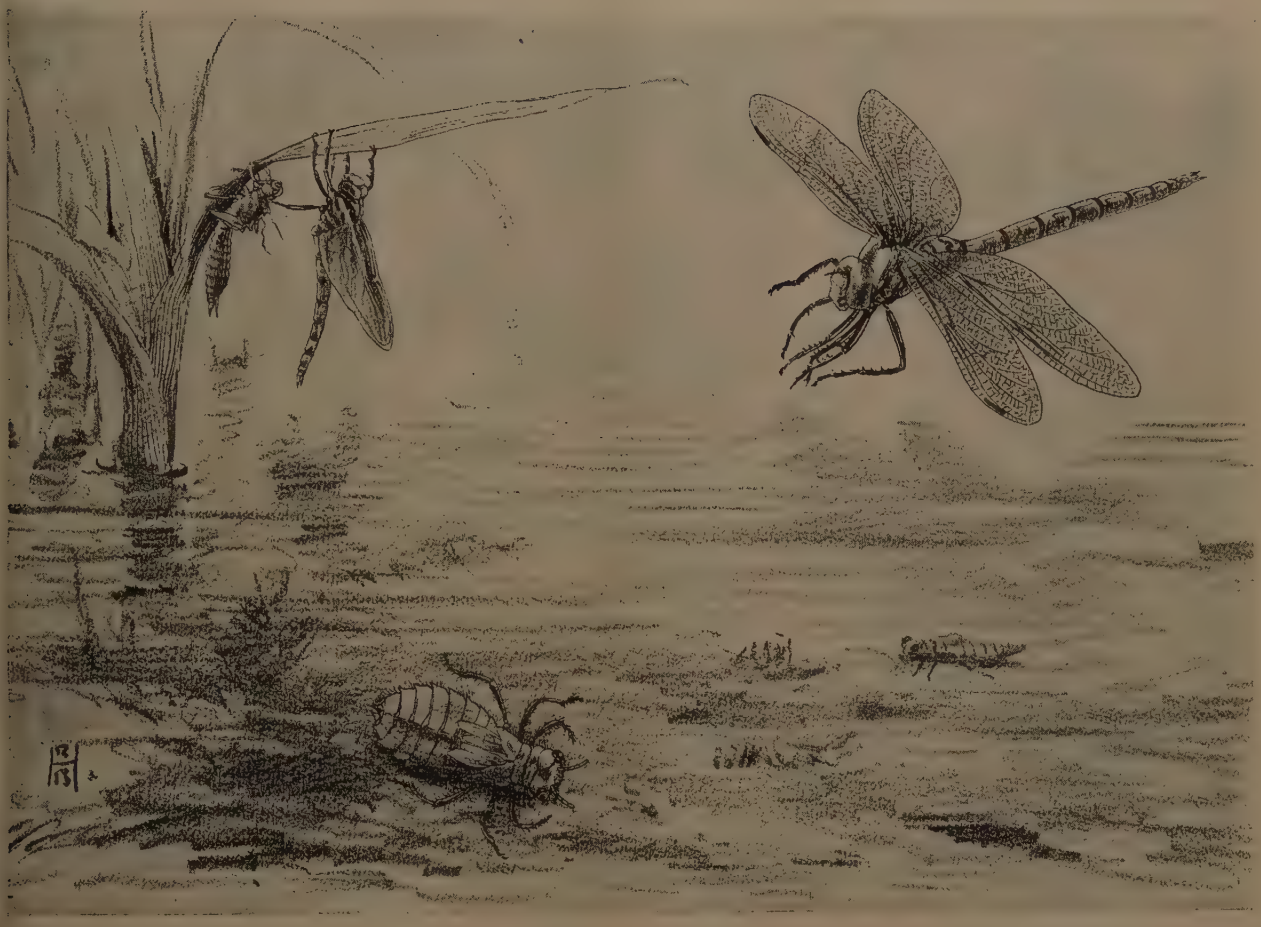

GRUMPY TAKES TO WINGS

THE STORY OF A BABY DRAGON-FLY

BY JANE ADAMS PARKER

ONCE upon a time, there was a queer little baby who lived down at the bottom of the Old Swamp. Of course his real name wasn't "Grumpy." Some folks call him water-dragon or dragon-fly nymph. But he did look just as grumpy as grumpy could be, lying flat in the mud. What looked like a long pointed chin rested on the ground waiting for some little water-thing to come by so that he could gobble it up. He was so nearly the color of the mud that sometimes the little water-folk did not notice him until it was too late. Then, snap! What seemed to be his long pointed chin dropped down from his face and shot out like two sharp claws. That was the end of little snail or whatever it was.

When he had finished chewing it up Grumpy folded his claws, which were really his long lower lip, back over his face like a mask and waited for something else to come along.

At first Grumpy's legs were quite long and spidery. But after he had eaten and eaten and grown bigger, they became strong and stout. Then he could crawl about in the mud or even up some water plants.

Often, too, he would shoot out into the water after another water-dragon. Then there would be

a terrible fight. And maybe Grumpy would eat the other little fellow up.

There were ever so many water-dragons just like Grumpy in the Old Swamp. When his beautiful mother had skimmed across the water she had dropped down thousands of eggs. These hatched out into just such queer looking little fellows as himself. All had large bulging eyes, two short feelers (antennae) and six legs.

And so Grumpy lived down at the bottom of the Old Swamp, until one day his skin seemed to be too tight. Then, he just climbed up a reed-stalk and split down the back. And out he came in a brand new suit.

He did this many times—maybe nine or ten—before he was a full grown water-dragon. Then one early, early morning, even before the sun had come up, something strange happened to little Grumpy.

Once more he crawled up the reed-stalk and his skin split open down the back. He pulled himself slowly out of his old shell and unfolded four wings that had been packed away in the little cases at his sides. He wasn't a water-dragon any longer, but a beautiful green dragon-fly.

It was lucky for him now that Cat Bird didn't see him because he was all weak and soft as he waited for the gentle breeze to dry his shell and harden his wings.

Soon the sun came out bright and warm, and Dragon-Fly was ready for flight. With a whirr of gauzy wings he was off—zizzagging over the Old Swamp, his six spiny legs held out in front of him like a basket to catch the tiny flying things. His big eyes bulged out from each side of his head, so he could see all around him as he flew along, crunching his food in his big strong jaws. Then, without stopping a moment, he rolled the wings and other hard parts of his meal up into a ball and spit them out with his big lips.

And now comes the best part of the story. Dragon-Fly couldn't possibly sting because he hasn't any stinger. Neither can he sew up lips, like some folks say he can, because he hasn't any thread and needle. So let's forget those silly things. Let's remember that one of our best helpers is Dragon-Fly.

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JAMES, THE CROW

BY PETE GETTYS

JAMES, the Crow, is our pet bird. He cannot, of course, talk to us but we all feel sure that we know what he would say if he could. The different tones of his voice are just as good as words.

Early every morning James greets me just outside the kitchen door. He has come for his breakfast. So I feed him bits of meat and scratch his head, which he seems to enjoy very much. When his appetite is satisfied he tells me so with happy throat noises.

James has a pan for drinking and bathing and enjoys this pan so much that you might almost call him a water bird. One night last winter it froze. It was the first ice of the season and our pet's pan of water was frozen solidly. That morning when I opened the kitchen door James had a little, round, muffin pan in his bill. Several times during the day when he saw someone coming he would run for this pan, begging for a drink.

Now of course I don't think that James thought of water when he came to me with the little pan the first time. Or did he? We will never know. It probably was just coincidence and he had the pan in his bill because he likes shiny, bright things. Of course, after we had filled this pan once he then knew what it was for.

In the picture, if you will look closely, you will see that James looks a bit as though he had been in a battle with a hawk. His feathers are quite ragged. The truth is that there is a bantam hen in the yard with whom James finds much happiness. The hen enjoys pulling out the crow's tail feathers just to be playful.

CATERPILLAR AND BUTTERFLY

BY FLORA C. STEVENS

I CRAWL on the ground and the children say, "You ugly old thing, and push me away."

I sleep in my bed and the children say, "The fellow is dead, let's throw him away."

I spread my wings and the children try to hold me fast as I rise and fly.

What is this all wrapped up in a shiny varnished skin and fastened to this branch? Could you guess who may be inside? Listen and I will tell you a story.

Little Caterpillar starts out in life with but one idea in his head and that is to find plenty of nice, green, tender leaves to eat and eat until he is full. Day after day he attends strictly to the business of getting fed, and to nothing else. That's why he has a bad name with some people, because he eats the leaves from the trees.

Well, after a while he gets tired of eating and grows sleepy. The summer is passing so he looks for a sheltered place to rest. He fastens himself to a branch and waits. Meanwhile his skin grows hard and shiny and faint marks appear on it. If you look closely you may see the outline of small wings, and rings around his body, and places for eyes and even small lines to show the tiny horns, called antennae.

What is happening to our little friend? Well, he doesn't know. He is sound asleep while all these changes are taking place. Some day our little caterpillar gets a radio message which we cannot hear, and begins to stir and look around. His tight skin breaks and out he crawls. Why, what is this? Where are his many feet? There are only six of them left. Two beautiful silk wings grow right out of his back. He knows what they are for. Gingerly he shakes them and stretches them out to dry. Now it will be possible to fly instead of crawl? He tries, and his new wings bear him up into the blue sky and the warm sunshine. Off he goes on his long search for nectar-filled flowers, and a new life of freedom opens before him.

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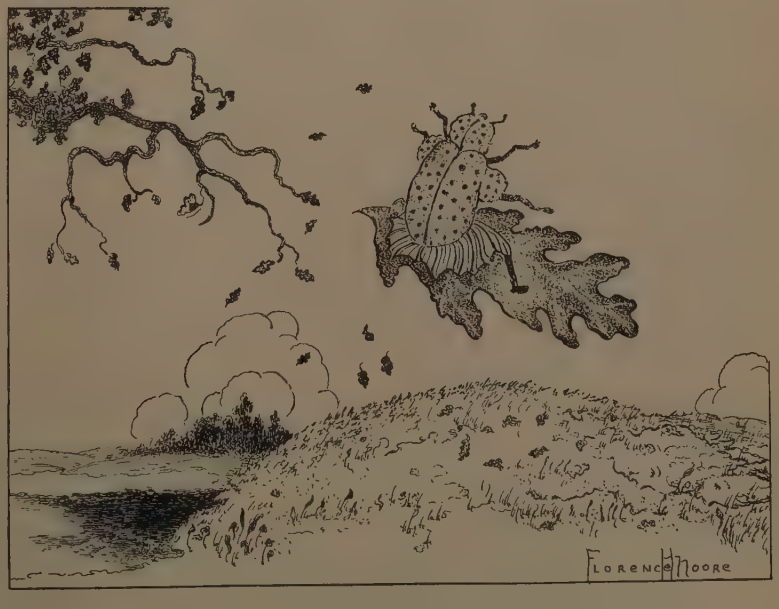
LADY BUG'S RIDE

BY FLORENCE H. MOORE



Lady Bug sat on her brown oak leaf,
With all her house work done;
Dressed in her very best polka-dot gown,
When West Wind started some fun.
He scooped up all the little brown leaves,
Like elfin sprites awhirl in the air;
Skipping, soaring, now up and now down,
Lady Bug too, was tossed here and there.
She held on tightly to her brown house,
But it quite took her breath away,
When she went sailing high over the hill,
And West Wind dropped her in the bay.
Poor Lady Bug knew not what to do;
She and her house were surely lost now;
But mischievous West Wind picked them right up,
And whirled them back home with a gleeful bow.

PUZZLE: Find West Wind and two Elfin Sprites.

BRINGING SHORE LIFE HOME

(Continued from page 75)

a whole large boulder into a solid clump of bivalvian blackness. A bunch of small mussels should be included in every pan, as they live unusually well in captivity, and help, by filtering it in their quest for food, to keep the water pure. Various clams or cockles may be found among the stones or in the sand or mud. The majority of these sooner or later will project a "foot" from between their shells, and with it draw themselves beneath the sand in a most interesting manner, thereafter to reveal their presence only by the siphons with which they reach upward into the water.

The pecten, or scallop, whose fragile empty shells are often seen on sandy shores, is the bivalve's farthest outpost toward the realm of floral beauty. These delicate creatures may sometimes be found after a storm alive, clinging to fragments of kelp which have washed up, or, rather rarely, in deep tide pools at very low tide. When one is discovered, it most certainly should be taken home. All of them, especially the younger ones, will delight you by occasionally swimming through the water with rapidly flapping shells, from between which, if you look closely, you will see rows of tiny eyes peering forth. Most of the bivalves will live quite well in the limited world you have provided; in fact, with a few exceptions, this is true of mollusks in general, and your mollusks will comprise a large and valued portion of your collection.

More abundant in numbers than in variety are the polyps, among which are included not only the true polyp, of coral atoll fame, but also the sea anemone and the jellyfish. The incredible, living, throbbing, transparent jellyfish is, in some of its forms, as delicate and beautiful as any creation of the deep, and, with sufficient care, this graceful creature may be kept daintily dancing for a week or more. But care it must have, for its two needs—very cool water, and oxygen in great quantities—are vital to it. On warm days, an ice bath for its receptacle may be found necessary, and air must be supplied by shaking the water in a jar, as for the naked mollusks, but several times each day. A jellyfish should be given a container to itself, and fresh water supplied at least twice a week. As they use oxygen so rapidly, our shallow pool becomes ineffective, and it is best to fill the container full. A rectangular glass aquarium will be found ideal. Jellyfish, it must be admitted, require a good deal of attention, but some are such exquisite creatures that, when a small one is found, it should be kept for a few days at least. The lovely anemone occurs everywhere in several varieties, and a few certainly should be carried home. They may be carefully removed from their rocks and anchored to the side of your pan or to a stone, where they will crawl about until whatever determines the happiness of an anemone is satisfied. But take care; large anemones have large appetites, and, though so beautiful and flowerlike to us, must appear veritable ogres to shrimps and little crabs. While they will appreciate a tid-bit now and then, more joy will be yours if the ones kept are small enough to make possible the supervision of their appetites. The curious alliances existing between this voracious creature and certain knowing little crabs are most surprising. For instance, one of the hermits is said to mount an anemone upon his shell, having learned that a fish even so rugged as to swallow him, large shell and all, with glee, has not such a cast-iron interior as to undertake the digestion of a large anemone. And there is a wise little fellow on a Pacific reef who, with a stinging, clinging anemone in either claw, fares forth in search of morsels too spry for his unaided awkwardness, and shares the resulting meals with his living weapons. Anemones are extremely common, and while other polyps may grace your collection only rarely, sufficient of beauty is here to make up for a certain lack of variety.

We now come to that motley crew known to science as the *Echinoderms*—the Spiny-Skinned people—and consisting of such varied and unlikely beings as the starfish, the sea urchin, the sea dollar and the sea cucumber. The last-named slug-like creature, with its coat of lumps and bumps, when contracted actually does resemble an oddly-colored little cucumber, and, in feeding, it exhibits a mass of blossoms which would tempt the botanist to place it with the floral family *Compositae.* Small individuals of some varieties may be kept satisfactorily in your aquarium for long periods, while others object to captivity in a decidedly gruesome manner. So bring home your "cucumber," by all means, but if he starts coming apart, gather up the feeble-minded little pest and take him down to the sea again. The starfish, often a brilliantly colored creature, will be found occasionally, and small ones may be kept for a considerable period. An exception to this must be noted, however, in the case of the tiny brittle star, which has a distressing way, in captivity, of casting its five slender rays, bit by bit, until finally naught remains but the button-like body. The sea urchin, or sea egg, resembles a spiny starfish rolled into a flattened ball. They may be kept readily, and, though the author once discovered a small one contentedly munching upon a very logy crab, such casualties are extremely improbable if the urchins kept are tiny. As much, however, cannot be said of the starfish, which relishes anything, and should be enthroned in solitary glory. The sea dollar is much like a small minutely-spined urchin upon which someone has stepped. The author has had no personal experience with this wafer of a being in a live state, but it is said to do fairly well in captivity. While the *Echinoderms* are not among the most common of the tidal folk, neither are they rare, and they will be found just often enough to add piquancy to the catch.

Let us consider, also, the lowly worm, which, in the sea, becomes a creature of intellect and of glory. On entering the world of water, all preconceived notions gained from knowledge of the earthly worm must be left behind, for here we find a thing of shimmering beauty, and not a mere grubber in the earth, but often a builder of masonry homes. Worms will be found in appalling variety, and a selection of them must be taken home, for some of them will be sure to enchant you with their glittering delicacy and their grace.

Should the populace of your pan start behaving in an abnormal manner—should hermits leave their shells, or secretive little creatures, suddenly forsaking their dens, perch upon rocks—then something has gone wrong, and if you wish your little beings to continue to dart and wiggle, you must quickly give them the aid for which they are pleading. For, possibly, they are overwarm, or perhaps someone has died, unnoted, and fouled their water, in which case it, and even the sand also, would need replacing. And from the mouths of our little ladies and gentlemen and our little imps and scamps, we imagine issuing a cry: "You may love us, and, by bringing us here, you may have saved us from our enemies. But we, in turn, love our swirling watery home, and, sooner or later, in such cramped confines as you can offer, all of us must die. So, if we be plentiful, take us home some day to our beloved ocean, and bring back enough of our brothers to fill our places. Our joy at finding ourselves at home once more will repay you well for your thoughtfulness." And in this way, your little ocean world may go on and on as long as you desire, with happiness both for yourself and for your little visitors.

And everywhere, because I have written this, people will, I hope, soon be gazing raptly into trays of salty water, watching, fascinated, the strange or almost human antics of finny and shelly little living beings. And so, perhaps, floors will remain unswept, and chores undone; but I feel sincerely that all who succumb to the spell which I have tried to weave will be hugely repaid for all of that, and that a new and growing interest and understanding will enter their lives which will bring them ever nearer Nature.

ALPINE PHOTOGRAPHY

(Continued from page 50)

There is less danger of objects obstructing the view of the crevices and rock protrusions that crease its sides. There are ancient trees, dwarfed, misshapen, stretching forth their rough arms over gorges that seem bottomless. There are meadows where marmots follow their trails among the lovliest of wild gardens.

On bright sunny days it is well to wait until cloud puffs—fleecy, white cumulus clouds—make their appearance in the sky before any exposures are made. They add life to a smooth, even sky—add something of interest to what might otherwise be a monotonous background. Such clouds help often in another way. They cast interesting shadow patterns over the evenly-wooded slopes that usually constitute the walls of valleys and gorges about the mountain's base.

Alpine photography is a field of photography which offers landscapes greatly affected by changes in light intensity which accompany changes in the time of the day. There is no field in which there is such an opportunity for photographic recording of the moods created by such changes. One day might yield a picture of wild, raging storms whipping through air channels walled by mountains and another day creates the mood of utmost peace and quiet in alpine meadows where flowers bloom in greatest profusion and there is a bounteous flood of golden sunlight. One hour might yield a picture of distant peaks, clear and sparkling—the next hour, a panorama of snowy-crested giants tinged with the rose and mauve that come with sundown melting in a purple haze.

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Claude H. Bennett
General Manager

BELLEVUE STRATFORD

IRIS PROGRESS

(Continued from page 83)

today were present to a certain degree in the flowers of 1920, but the shades were not so highly developed nor were the present day contrasts and blends then in existence. A few of the modern varieties find their counterpart in such ancient varieties, just as a few of the modern dogs find their

COURTESY ROBERT WAYMAN

King Karl. The upper petals are of a delicate apricot shade, peppered pink and brownish red, lower petals ivory with edging of maroon dots

counterpart in the wolf pack. Thus does San Francisco, the splendid white plicata, resemble the small and not so beautifully lined E. L. Crandall; as the large and floriferous Desert Gold, the beautiful light yellow, resemble the older Shekinah; the splendid Purissima or Venus de Milo, pure whites, resemble the once splendid White Knight; and the present day Dauntless, red, resemble the small Seminole.

But there were no such pleasing color blends as Beau Sabreur with standards of orange-yellow and falls of reddish brown; of King Midas with standards of golden buff and falls of garnet-brown; of Rameses with petals of crinkled gold and pink; or of Sir Michael with standards of clear, opalescent blue and falls of dark purple.

Nor did the blooming season extend over such a length of time. The tall bearded species of iris, which is the best known branch of the iris genus, now has a season of bloom extending over many months. The great mass of varieties come into bloom in the late spring and bloom from four to five weeks. In recent years experimentation has been made in producing fall-blooming irises. Autumn flowering varieties now to be purchased include Autumn King, Autumn

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COURTESY ROBERT WAYMAN

Moonlight, a giant silvery flower, the throat marked greenish gold with a striking yellow beard. Fragrant

Queen, Peggy Babbington, Golden Harvest, Polar King, King Junior, Frost Queen, Laura Hutcheson, September Skies, Olive White, October Opera, Dorcas Hutcheson, Equinox, Eleanor Roosevelt, Southland, Martie Everest, and Franklin Roosevelt. If hybridizers devote more time to this phase of iris development, we shall undoubtedly have a race of fall blooming varieties equal in number and perfection to those which now bloom in the spring.

The lovely dwarf irises and those intermediate in height between the tall bearded and dwarf sections greatly extend the season of bloom in our gardens. The intermediates bloom several weeks before the tall bearded, and the dwarfs commence to bloom two to three weeks before the intermediates. A few dwarf varieties such as Jean Siret and Souvenir de Lieutenant Chavagnac bloom throughout the summer in some sections. And when one considers the blooming time of the other species of iris such as Siberian, Japanese, Spuria, Speciosa, Oncocyclus, Regelia, Dutch, Spanish, and miscellaneous types, we find that iris are in bloom more than halfway around the calendar.

Ignorance of the average flower lover as to the culture of irises leads many to believe that the best planting time is during the late fall or early spring as with other plants; but this belief is erroneous. The ideal time to plant the roots, or rhizomes as they are termed, is after the blooming season—preferably in late June, July, or August. The roots are dormant at this time and will commence to grow again in late summer, becoming firmly established by the time winter sets in.

Good-sized roots planted during these months invariably will bloom the following season. Iris roots are generally ordered by mail through catalog descriptions direct from a commercial grower who may be 30 or 3,000 miles away, for the roots, when dormant, are shipped satisfactorily for long distances. If you have none of the newer irises in your garden, make a trial planting and see for yourself the great advance that has been made in this flower during recent years.

Collecting irises is as fascinating as t collection of stamps or any other hobby. B cause every variety is distinctly different, th garden of an iris collector during the bloom ing season is a spot of endless delight t genuine flower lovers. Iris flower shows a held during the blooming season in man of the larger cities throughout the countr from Boston to San Francisco. Throug these displays and the gardens of privat and commercial growers, the great flowe loving public is becoming more and mor aware of the true value and worth of th iris as a decorative flower—both inside th house and outside in the garden.

Squash Borers

Everyone is familiar with the difficulty o doing anything about it when a borer ha become entrenched in a squash vine. Usuall it means that the vine will bear no squashe that year, for the borer not only eats th substance of the vine, but it so injures i that other insects attack the plant and a least partially girdle it and cause it to breal off. Conclusions arrived at by the Massa chusetts Agricultural Experiment Station in dicate that the way to control the squash vine borer is to prevent it from getting int the vine. In other words, destroy the egg which hatch into borers while the eggs ar still attached to the plant. In Bulletin No 218 issued by the Station, Harlan N. Worth ley tells his experience in watching th moths as they deposit their eggs on the sten of the squash vine. They treated these egg to see if they could be destroyed readily b commercial products. Mr. Worthley report as follows: "The experiments indicate tha almost complete relief from squash vin borer attack can be gained by four appli cations in July of 'Black Leaf 40' at strength of one part in one hundred part of water where applications are made wit a power sprayer. At the same strength thi material is over 90% effective applied wit a low pressure, small capacity outfit, such as the compressed air sprayer. Applied at strength of one part in two hundred an fifty parts of water and with the aid of power sprayer, the material is also over 90% effective."

Thus, it is possible for the gardener t take a small hand sprayer such as might b used for spraying flies in the house, and b applying the "Black Leaf 40" solution wit it, to eliminate the squash borer.

If the borer has made entrance to th squash vine, sometimes at least part of th crop can be saved by covering the vine wit dirt at least a foot or so from the mai stem, and then to encourage the runners t root at intervals as they stretch out alon the ground. Care should be taken not t destroy the young rootlets which are pushe out. The plant gets sustenance from thes auxiliary roots, and should borers gain en trance to your plants, the auxiliary roots ar helpful. However, if "Black Leaf 40" i used as directed by the Massachusetts Ex periment Station, there should be little o no difficulty.

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With the Eskimos

George Miksch Sutton, artist and naturalist, spent a year with the walrus-hunting Eskimos who live on Southampton Island in Hudson Bay. It was a year full of adventure and in *Eskimo Year* he tells us of this fascinating period. Dr. Sutton has made previous report on the fauna of the island, and in this volume he devotes himself to the human relationships of the Eskimos and their relation to their natural surroundings. Since the period of the book covers four seasons it gives us a picture that is complete. One of the characteristically entertaining episodes found in this book is devoted to a game of five hundred played while snowbound and with a deck of cards so dirty and dog-eared that Dr. Sutton was forced to recognize the ace of spades, not by its conventional markings, but by a scratch across the dirty face of the card. Here, indeed, is a fascinating and different book. It is published by the Macmillan Company.

Ortho-scopic Birds

Following the same plan as *The Animal Kingdom,* the Orthovis Company of Chicago has now brought out *The Bird Kingdom.* Drawing upon the excellent habitat groups at the Field Museum of Natural History for their picture material, the publishers present the three dimensional idea attained through the use of the little eye glasses of red and blue. This operates to give depth to the pictures. There is accompanying text descriptive of the subject matter of each picture. This latest volume, as does its predecessor, sells for two dollars.

Photographic Contest

In order to obtain new and interesting pictures, and to inculcate in motor travelers the practice of really seeing the country through which they are traveling instead of watching the speedometer to see how many miles have been covered, The Provincial Tourist Bureau of the Province of Quebec is conducting a photographic contest. The subjects may be anything seen in the Province, such as scenery, people, unique buildings and industrial activity. The contest closes October 1, 1934. Photographs submitted should not be retouched or colored, mounted or framed; should be marked with the name of the sender and accompanied by the negative and date as to the place taken and the subject involved. There will be 87 prizes, with first and second awards of fifty and twenty-five dollars respectively. Entries should be sent to Photography Contest, Provincial Tourist Bureau, Parliament Buildings, Quebec, Canada.

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American Bison

Long popular as a condensed text, a ne and enlarged edition of Martin S. Garre son's *Short History of the American Biso* has been brought out by the America Bison Society. It is a booklet particularl valuable for schools in connection wit study of this American mammal whose lif is so intertwined with the development o our West and who suffered so in the process Copies of the booklet may be obtained fro the author, M. S. Garretson, N. Y. Zoo logical Park, New York City, at twenty five cents each.

The Evolution of "Humane"

By Lois Banfield

The interpretation of the word "Humane" has been mainly along the lines of kindnes to domestic animals, the cat, the dog, th horse, etc. But now our concept is expand ing to include all of life, all of the worl with its myriad life forms. More and mor we learn from science that all life has feel ing, that the universe is a unit, that every thing in it is vitally affected by everythin else in it. We begin now to have a ne idea of that two-thousand-year-old teaching "As ye sow, so shall ye reap." It seems tha there is no limit to the application of thi principle to our every act, even our ever thought in our everyday life.

In the great National Parks where the bears and the other animals have never had occasion to fear a human being, where they have never heard the sound of a gun, there is actually no danger from these animals unless they are wounded or have young. It would therefore seem that the responsibility for wild animals being dangerous lies with us and not with them. We begin to sense the lack of true sportsmanship in taking advantage of living creatures for our own purposes, whatever these may be.

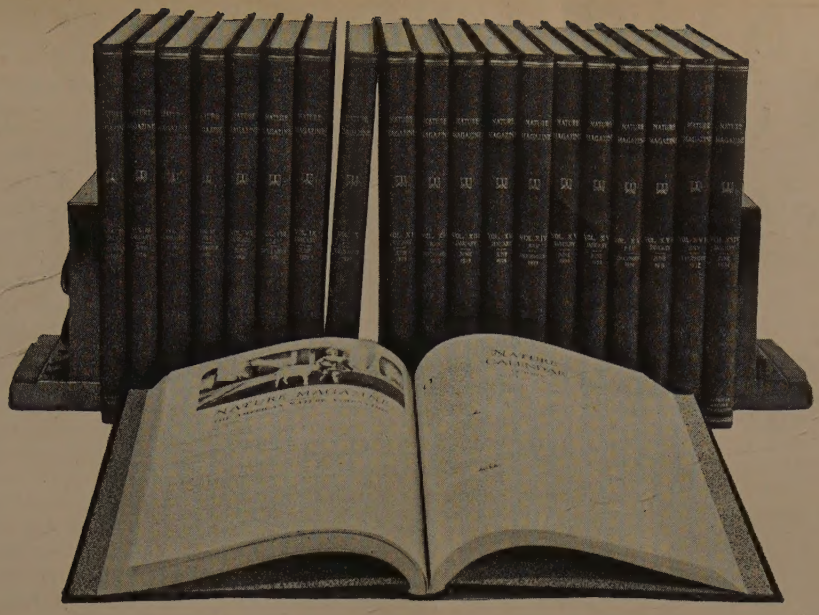
At this stage of our growing concept of the universe and its life, our consciousness begins to awaken to the possibility that some of our troubles as a race may be the result of destructiveness of animal life. We are now well on our way to the point of view of the poet who said:

"He prayeth best who loveth best
All things both great and small;
For the dear God who loveth us
He made and loveth all."

Woodpeckers Help

Woodpeckers last winter helped Gov ernment scouts to run down elm bar beetles, insects that carry the Dutch elm dis ease now threatening the American elm with extinction. The woodpeckers, working on beetle-infested trees, removed the outer bark The lighter-colored inner bark thus exposed was a signal to inspectors looking for in fested trees.

Crews under the direction of entomolo gists and plant pathologists of the United States Department of Agriculture scouted for diseased and beetle-infested elm tree through Connecticut, New York, and New Jersey, where the Dutch elm disease is known to be present. A total of 2,138 dis eased or badly beetle-infested trees were destroyed.



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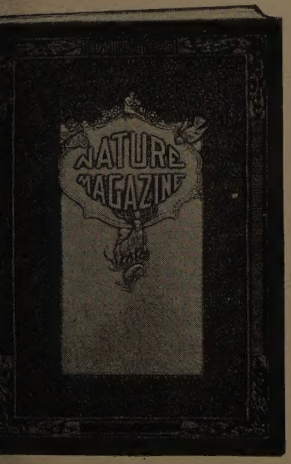

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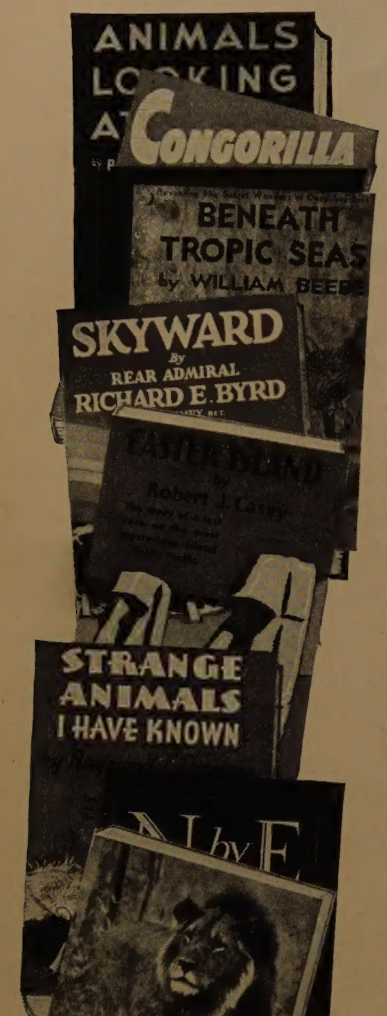

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THE FLICKER CODE

By W. F. Binderup

After recent observations on the fli*Colaptes auratus*, I have arrived at the clusion that this bird is either the dum or the wisest, of our feathered friend believe the latter.

In the last few weeks I have awakened by the "Quit-u, quit-u" of flic calling to each other. This was followe a repeated tap tap on metal. I automati put it down as a woodpecker of some pecking the iron shade of a street light

After hearing this for several weeks, out witnessing the act, I began to wo if any bird could be so dumb as to three weeks on metal without discove the impossibility of his work. He m know that he could not build a house th and he would not be searching for ins

A few days ago, while looking out o upstairs window, I saw Mr. Flicker on the shade of a street lamp. I grabbed binoculars and watched the bird. He looking about him; then he began pec on the iron shade. Thus he continued about five seconds, then quit and struc listening pose. "Quit-u, quit-u" was his utterance. Then he began pecking ag then he listened once more.

Suddenly, from a distance of about hundred yards, I heard the "Quit-u, qui of another flicker, followed by the s metallic sound as this other flicker pec on another shade.

I watched and heard these two birds versing, and tapping to each other by me of voice and code for about ten minute am firmly convinced that they were sig ling to one another, in the same way did the American Indian.

Southeastern Trees

Trees of the Southeastern States by W liam Chambers Coker and Henry Rol Totten is a much-needed volume. It d with trees in a region of rich variety outstanding arboreal beauty, yet one wh has not been adequately and separately ered with a text of the character of present volume. Some years ago the auth brought out a little book on the trees North Carolina and it met with popular preciation. They have now gone outside borders of that State and give us this volu on tree identification for the larger regi Illustrated with simple and clear drawi and with equally simple yet complete scriptive text, this book covers more t two hundred native species of trees. It a valuable and welcome addition to literature. It is published by the Univer of North Carolina Press at Chapel Hill sells for two dollars.

Wild-life Demonstration

As a demonstration project in wild- restoration, the United States Bureau Biological Survey will take over the adm istration of six hundred acres of the partment of Agriculture Experiment Stat at Beltsville, Maryland. At present there more than fifty species of birds nesting the tracts and there is a considerable po lation of small mammal life.

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